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OCTOBER, 1924.

SPECIAL NUMBER

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ON

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2, Howard Street, Strand, London, W.C. 2.

EARLY MENTAL DISEASE TREATED IN A GENERAL HOSPITAL:

AN ANALYSIS OF FIVE HUNDRED CASES.

BY

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THE following account gives an analysis of and commentary on one year's work from May, 1923, to May, 1924, in connexion with the wards in the Royal Infirmary of Edinburgh reserved for cases of early mental disease and incidental delirium. A period of fifty-four weeks has been taken to allow for a small number of cases not mentally affected, which were admitted to the wards and which are not included in the analysis for this reason. This has the further advantage of making the number exactly 500, which is convenient for calculating percentages. Of the cases admitted some are sent in by private practitioners for observation; a certain number consist of cases transferred from ordinary medical or surgical wards because of the development of mental changes which render their retention in these wards unsuitable; and a considerable number are brought by the police, or other outside authority, for observation. Many of the cases make a good recovery without incurring the trouble and stigma of certification as insane, but practically all present, on admission, considerable difficulty either in diagnosis or in treatment if it were to be conducted outside an institution. In order of frequency cases fall into the following groups, although it must be understood that this grouping is not suggested as a method of classification:

1. Alcoholic cases, 133 (26 per cent.).
2. Melancholia, 87 cases (17 per cent.).
3. Confusional states, 80 cases (16 per cent.).
4. States of dementia, 52 cases (10 per cent.).
5. Psycho-neuroses, 35 cases (7 per cent.).
6. Post-epileptic states, 29 cases (6 per cent.).
7. Cardiac delirium, 22 cases (4 per cent.).
8. Mania, 20 cases (4 per cent.).
9. Gross cerebral lesions, 16 cases (3 per cent.).
10. Fixed delusional states, 17 cases (3 per cent.).
11. Primary mental defect, 9 cases (2 per cent.).

The general principle followed with regard to disposal of the cases was that patients were put to bed for a period of one or two weeks' rest. By the end of three weeks it was generally quite possible to determine whether the case was likely to recover under treatment so far as to be able to proceed for a period of convalescence in the country or to return home. If the case appeared likely to recover to this extent under hospital conditions treatment was continued, but if at the end of about three weeks no improvement was discernible the patient was, in most cases, passed on to a mental hospital, either after certification, or in some cases as a voluntary admission.

The proportion of cases discharged sufficiently well to return home was 72 per cent. of the total (or, if the alcoholic cases be left out of account, it was 64 per cent.). The proportion of the cases passed on to mental hospitals was 17 per cent. of the total (or, excluding the alcoholic cases from consideration, it was 22 per cent.). Five cases only entered mental hospitals as voluntary patients, but these would probably have been more numerous if this method of disposal had been available for pauper patients. The deaths from all causes amounted to 7 per cent. of the total admissions, including a considerable number of the attempted suicides. Transfers to other (non-mental) hospitals, chiefly a Poor Law hospital, accounted for 3 per cent.

ALCOHOLIC CASES.

There were, in all, 133 cases definitely due to alcoholic excess. Most of these were brought in by the police as cases of doubtful diagnosis for observation. Of these, 102 cases (74 male and 28 female) were in a stuporous state, in which they continued for periods varying from some hours up to several days. The number of cases of delirium tremens was 14 (13 male, 1 female), and 5 cases were admitted suffering from chronic alcoholic insanity (3 male, 2 female). In cases that showed delusions, the type associated with the Korsakoff syndrome, involving loss of sense of time and place, was very marked. Thus one patient who was able to give a good account of novels he had read, when asked suddenly where he was, gave the name of a public-house, and when asked how he explained the presence of the bed in which he lay, laughingly said he supposed it had been put there to pass away the time. It was found that 26 per cent. of all the cases admitted were directly due to alcoholic excess. It is interesting to compare this figure with the corresponding state ten years ago. In the year 1913, 42 per cent. of the patients admitted suffered from alcoholic excess and the number of cases of delirium tremens was four times as great as in the year now under review. The age of persons suffering from alcoholic excess presents a feature of interest, the average age of the male alcoholics being 47, and that of the women 45 years, while only two men and one woman were under 30 years of age. From the fact that the average age of these persons in 1914, at the commencement of the war, was 37, it is obvious that they could have taken no very active part in the war, and that war conditions have had, therefore, practically no influence in the production of alcoholism, so far as the group of Edinburgh Hospital cases is concerned. Further, excessive drinking among the young would appear to have diminished almost to a vanishing point. In addition to the cases which are directly due to alcoholic excess, the question of alcoholism enters, as a partial cause, into the histories of a number of other patients suffering from psycho-neuroses and other mental states, so that it would be quite safe to say that alcoholism still enters in some degree into the causation of at least 30 per cent. of all these cases of slight mental deterioration among persons of middle life and over.

Some cases were admitted suffering from the effects of drinking methylated spirit. In general, the resulting intoxication was more violent in effect, but more transitory in duration, than that produced by whisky only. After drinking methylated spirit, excretion by the kidney was very rapid, and clear, almost colourless, urine was passed which in two cases had a specific gravity less than that of distilled water.

MELANCHOLIA AND DEPRESSION.

Of the 87 cases admitted for depressed or melancholic states 58 were cases in which suicide had been attempted. The most prevalent method of suicide employed was by cutting the throat (17 cases); lysol came next in order of popularity (13 cases), coal-gas inhalation was responsible for 7 cases, and drowning had been attempted in 6 cases. In considerably smaller numbers the means used were: ammonia (3 cases), paraldehyde (3 cases), morphine (2 cases), oxalic acid (1 case), hydrochloric acid (1 case), creosote (1 case), arsenic (1 case), tincture of belladonna (1 case), opening of blood vessels (1 case), and falling in front of a railway train (1 case). Simple melancholia without delusion characterized 75 per cent. of the depressed cases; and it is important to note that most of the attempts at suicide were made by persons suffering from simple melancholia without delusions.

With regard to the cause of melancholia and depression, a bad family history was found in this type of mental disease more frequently than in any other, 26 per cent. of the cases having had from one to four immediate relations definitely insane. In the great majority of the cases it was impossible to attribute the cause to any one factor, a complex, consisting in part of poor physical development, overwork, and difficulty of adaptation to surroundings, being usually present. In addition, a number of cases showed some definite physical toxic influence which might be regarded as a precipitating cause of the attack for which the patient was admitted. These included a septic condition of the mouth, general alimentary disorder with constipation, thyroid gland disorders, and various preceding febrile conditions. A definite toxic precedent could be traced in 45 per cent. of these cases, although it was sometimes difficult to say whether the toxic condition should be regarded as the cause or as one of the results of the general physical and mental debility. In 60 per cent. of the cases evidence of

prolonged mental strain arising from the patient's circumstances was elicited—for example, the worry of a drunken husband, of financial conditions, disappointment in some matter upon which the patient had long been counting, loss of relatives, and very frequently idleness consequent upon being out of work. The onset was usually gradual, and in many depressed cases symptoms or recurrences had been noticed for several months or years. The largely temperamental nature of this type of mental disorder was evident from the fact that one-third of the cases were recurrent. Simple melancholia was found to be much commoner in females than in males (85 per cent. and 15 per cent. respectively); but suicide was attempted more frequently in male melancholics (3 males to 2 females). Among the elderly female cases the depression began definitely, in one-third of the cases, in association with the onset of the climacteric. The general plan of treatment included rest in bed, attainment of sleep, if necessary by hypnotics, removal of the toxic or other physical cause, and the provision of light useful work as soon as the patient could take an interest in it. The result of hospital treatment was very satisfactory in melancholic cases, over 60 per cent. being discharged cured, or at least sufficiently well to return home, after about three weeks' detention. Less than 40 per cent. passed on to mental hospitals as more chronic cases.

CONFUSIONAL STATES.

The 80 cases showing a definite confusional condition included 17 post-operative cases (most of which were associated with sepsis); 4 puerperal cases which were also septic; 16 cases of concussion; 7 nephritics with albuminuria; 13 toxic cases following febrile conditions, especially influenza; 13 cases of pneumonia; 3 cases of diabetes; 2 cases of pernicious anaemia; 1 case of tuberculous kidney; 1 case of haematemesis; 1 case of malignant tumour; 1 case of acute lymphatic leukaemia; and 1 case of pellagra. Most of the confusional cases had delusions of a mild character and very varied type, and 2 cases showed complete transitory loss of memory. Leaving out the cases of concussion, toxic and exhaustive elements were very obvious in the great majority, and such cases were very amenable to treatment; the chief conditions required for treatment being complete rest in bed for a period of two or three weeks, with removal of the septic focus, or treatment of the general septic condition.

No characteristic type of delirium was noted in these conditions, except that in the pneumonia cases, when collapse was impending, the weakness and mental obfuscation produced by the toxic state induced signs resembling those described by Mistress Quickly in the end of Falstaff: "After I saw him fumble with the sheets and play with flowers and smile upon his fingers' ends, I knew there was but one way; for his nose was as sharp as a pen, and 'a babbled of green fields" (*King Henry V*, II, iii, 14). In several other cases associated with cardiac dilatation, the delirium partook of the cardiac type. A patient with pernicious anaemia showed delirium of a very striking character. During the day the patient, who had been doing his work as a railway guard up to two days before admission, was perfectly clear, but every evening he developed a state of wild excitement, imagining that preparations were being made to burn him at the stake, tied to a woman. There were evidently two elements in this complex—one was the element of cardiac excitement, the other, apparently, was some repressed memory stirred up by reflection on the unknown cause of his serious disease. As the anaemia and cardiac dilatation improved the nightly recurrences of the delirium became less terrifying till they disappeared completely.

CARDIAC DELIRIUM.

Cases with heart lesions who had lapsed into a state of delirium numbered 22. Of these, in 40 per cent. myocarditis with feeble cardiac action was present; in 40 per cent. mitral disease (of which one-half showed auricular fibrillation); and in 20 per cent. aortic incompetence. None of the cases of cardiac delirium was younger than 41, and the average age was 59 years. A correspondence has taken place recently in the BRITISH MEDICAL JOURNAL (July, 1924) as to the type of delirium present in cardiac cases. In my experience the special feature of cardiac delirium is restlessness or excitement, proceeding to anxiety or apprehension in 90 per cent. of the cases—

> "Like one that on a lonesome road
> Doth walk in fear and dread,
> And, having once turned round, walks on
> And turns no more his head,
> Because he knows a frightful fiend
> Doth close behind him tread."

The mechanism appears to be a sense of the necessity for muscular effort, coupled in severe cases with a sense of impending dissolution. The disorientation as to place, if present, is merely incidental to restlessness. If the patient imagines himself to be at his place of business this is merely because of the activity and anxiety associated therewith. Another special characteristic of cardiac delirium is that it tends to appear especially towards night, and may pass away completely every morning as the vital tide returns. One patient imagined regularly every evening that "a man with a gun took up his position outside the window", intending to shoot him, and this was associated with great restlessness and anxiety. Another remembered clearly, on the morning of admission, having struggled in the night with his daughter for possession of a knife which he wanted because he thought "his life had to come to an end." Still another was greatly distressed because he had "to rush for the train to business in Edinburgh." The delusion of cardiac delirium thus differs greatly from the delusion of the alcoholic case, which very definitely involves time and place, and is often of a pleasant, sensuous, or amusing nature. The degree of excitement in cardiac cases offers considerable help in assessing the amount of impairment in the function of the heart for the time being.

STATES OF DEMENTIA.

This type included 13 cases of adolescence between the ages of 10 and 30 years, in whom the occurrence of such symptoms as katatonia, impulsiveness, bizarre delusions, negativism, and general mental aberration warranted a provisional diagnosis of dementia praecox. A few improved sufficiently to go home, but most of these cases were transferred to mental hospitals. Senile dementia (20 cases) was, in general, associated with arterio-sclerosis and other signs of physical senescence. The most interesting group of cases showing dementia were those associated with syphilitic infection. Two cases of confusion, so profound as to give the impression of dull stupid dementia, occurred at an early stage of this disease, and were presumably due to syphilitic cerebral endarteritis. The mental symptoms in both disappeared after treatment by novarsenobenzol, and these patients became fit to return to their work. These cases are important as showing the great value of early diagnosis and prompt commencement of treatment in patients with cerebral syphilis who are otherwise apt to lapse into permanent dementia. The cases of dementia paralytica numbered 13 (12 men and 1 woman), and the average age of onset was 40 years. All these cases were undiagnosed before admission. The symptoms presented are therefore of interest in regard to diagnosis of general paralysis at an early stage. Only 6 of the cases showed any delusions, and of these 2 only had grandiose ideas. Difficulty of articulation was present in 4 cases. In 2 cases blindness, due to optic atrophy, had existed for several years before mental change supervened. The condition of the reflexes varied much, the knee and ankle jerks being exaggerated in some, absent in others, and in still others exaggerated on one side and diminished on the other. The plantar reflex was extensor or varied from time to time in a few cases, but was flexor in the majority. The signs common to all were: failure or diminution of the pupillary reflexes to light, weakness of power of judgement, physical weakness, tremulousness, and strongly positive Wassermann reaction in the blood and cerebro-spinal fluid. The colloidal gold reaction, in those of the cases where it was carried out, conformed to the finding of the Wassermann reaction. All the cases, with one exception, were unaffected by antisyphilitic treatment, and were transferred to mental hospitals. With regard to one case with well marked delusions, who lost all mental symptoms under treatment, the Wassermann reaction in blood and spinal fluid, and the colloidal gold reaction, nevertheless remained strongly positive, although the patient had received 18 grams of novarsenobenzol in six months.

PSYCHO-NEUROSES.

This group included 27 cases of hysteria and 8 of neurasthenia. With regard to cause, definite physical pelvic abnormalities, such as ovarian tumour, uterine prolapse, hysterectomy, etc., were found in 50 per cent. of the hysterical cases, thus justifying the ancient Greek name of the condition. In this group a previous sexual trauma in the Freudian sense was found to be especially prevalent, and the method of psycho-analysis was more applicable than in any other type of mental aberration. In my opinion, however, the employment of this procedure, while very useful in elucidating the vagaries of the patient, is more apt, considered as a therapeutic agent, to be followed by increased mental unrest and distress than by improvement. One case in every four had delusions or hallucinations, most commonly of hearing. All the cases were improved after an average stay in hospital of three weeks, and one only passed on to a mental hospital as a voluntary patient. One neurasthenic was a morphine habituée, and in addition had had laparotomy performed several times, apparently to no purpose. This was the only case of drug addiction, which seems to be a much less frequent habit in Scotland than among more southern peoples.

POST-EPILEPTIC STATES.

The number of cases admitted to hospital because of some abnormal state following on epileptic seizure was 29. Of these, 12 per cent. were maniacal or homicidal, 25 per cent. confused with a tendency to automatic behaviour, 25 per cent. had definite delusions, 25 per cent. were greatly depressed, and 13 per cent., after a period of stupor lasting from a few hours to several days, became quite normal. The average age of the epileptics treated was 37 years, and one-half of them were mental defectives in a marked degree.

MANIA AND MANIC-DEPRESSIVE INSANITY.

The number of maniacal cases was 20, of which 3 were recurrent. A very close connexion with previous debilitating factors was evident in 80 per cent. of the cases. These factors included typhoid fever, exhausting journeys, the strain of nursing a relative through a long illness, the puerperium, and in a few elderly cases the climacteric. The average age of cases was 45 years. This type of insanity was not so suitable for treatment in a general hospital as were simple melancholic cases, and, while 40 per cent. recovered sufficiently to go home, 60 per cent. passed on to mental hospitals.

GROSS CEREBRAL LESIONS.

These included cerebral thrombosis or embolism (6 cases), cerebral tumour (2 cases), meningitis (3 cases), encephalitis lethargica (4 cases), and lead encephalopathy (1 case). The mental changes in these cases were of the confusional type, passing later into dementia or death.

FIXED DELUSIONAL STATES.

Cases with fixed delusions numbered 17, including 3 cases diagnosed as paraphrenia and 1 as paranoia. These cases, with two exceptions, failed to respond to treatment, and were transferred to mental hospitals after a period of two or three weeks' observation.

CONCLUSIONS.

1. The chief deduction to be made from this analysis is the great usefulness of a general hospital in treating slighter or undiagnosed cases of mental disorder; of these 64 per cent. could be treated successfully without transfer to a mental hospital. This especially concerned melancholic cases.

2. Mental disorder produced by alcohol appears to have greatly decreased and to be confined now chiefly to elderly persons.

3. Physical conditions (infective, exhaustive, or reflex) as partial causes were discovered in the majority of the cases of melancholia, mania, confusional insanity, and psychoneuroses.

4. Types of disorientation and delirium, that are to a considerable degree characteristic, can be recognized in association with different causes of mental disorder.

I desire to acknowledge my indebtedness for much help to Dr. W. McAlister, deputy superintendent of the Royal Edinburgh Mental Hospital; to Dr. David Slight, assistant in the department of psychology, Edinburgh University; and to Dr. Helen Young.

THE PATHOLOGY AND SURGICAL TREATMENT OF ANGINA PECTORIS.

BY

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I. DEFINITION.

SOME writers on angina pectoris include under this heading syndromes which have no connexion whatever with the condition. Many cardiac diseases are accompanied by precordial symptoms similar to those of angina, but this name should be restricted to a sensori-motor syndrome of the myocardium, sudden in onset, sometimes ending in death, and not depending on dilatation of the heart. Acute pulmonary oedema, the *angine de poitrine de décubitus* of French writers, ought not to be classified as angina, since it is a syndrome arising from an acute dilatation of the left ventricle; it should be included in the asystole group. A fundamental difference exists, moreover, between angina pectoris and the phenomena of cardiac dilatation, anginal attacks only occurring when the myocardium is healthy and acting well; they diminish or disappear as soon as the heart becomes weak and dilated. Aortic pain must similarly be removed from the category of angina, since this condition results from the distension of a diseased aorta by a sudden increase of intra-aortic pressure. The precordial pain in this case is like that of angina, and the aortic distension necessarily gives rise also to cardio-vascular reflexes, but the condition is related exclusively to the aorta, and is probably never the cause of death. An additional difficulty in distinguishing clinically between angina and aortic disease is that the same factor—for example, sudden exertion—may bring on at the same time two phenomena, the anginal spasm referable to the myocardium, and aortic pain originating in the aortic wall. But when the mechanism of their production is considered a sharp distinction must be drawn between these two pain syndromes, and it must be emphatically denied that an attack of angina pectoris can ever be produced by aortic distension.

II. PATHOLOGY.

I cannot give assent to the aortic hypothesis put forward by Clifford Allbutt, Smith, Wenckebach, and Vaquez, according to which angina pectoris is exclusively due to aortic distension. It is impossible to imagine such a distension occurring without there being an increase in the intra-aortic pressure, and yet those very writers who uphold the theory of aortitis admit that the blood pressure is not invariably increased during an anginal attack. Then, again, it is difficult to account for the occurrence of death if there is nothing more than a simple distension of the aorta. The reflex inhibition due to stimulation of the vagus, which Clifford Allbutt cites as the cause of death, ought to be accompanied more often by cardiac phenomena referable to the parasympathetic system, in particular by slowing of the heart beat. Yet very often the beat is quickened during an attack, and death supervenes on a condition of marked tachycardia or arrhythmia. Mackenzie suggests as the cause the onset of myocardial exhaustion, but in none of his publications apparently does he distinguish between this condition and that which other writers recognize as myocardial insufficiency leading to dilatation. Opposed to this hypothesis of Mackenzie is the fact that in the anginal patient his attacks occur only whilst the myocardium is acting well; so soon as it becomes weak, and dilatation occurs, the attacks diminish and cease. Coronary disease can no longer be advanced as a hypothetical cause of angina pectoris. Cases of disease of the coronary arteries without anginal symptoms are known to occur, and also cases of angina pectoris in the absence of coronary disease. It appears advisable, therefore, to replace the anatomical idea of coronary disease by the physiological conception of an inadequate coronary circulation. Angina pectoris cannot be described as an inflammation of the coronary arteries, since either may exist in the absence of the other. It is possible, however, to say that all angina pectoris is the result of an inadequate coronary circulation, which may occur when

the arteries are healthy, but is more likely when they are in a state of sclerosis. This suggestion will account for the frequency of coronary disease in angina; anginal symptoms may, nevertheless, originate in a heart in which the coronary arteries are healthy, or be absent even when there is extensive sclerotic change.

The explanation appears to be as follows: The anginal attack arises from a disturbance of the balance between the work of the myocardium and its blood supply through the coronary arteries. This disturbance may occur in the case of a healthy heart, but is more common if the coronary arteries are somewhat obstructed. It is conceivable that even healthy coronary arteries, faced by an excessive demand, may be unable to respond sufficiently to provide an adequate myocardial blood supply, and consequently it is not out of the question that such a disturbance of balance may occur in a perfectly healthy heart. In this way can be explained anginal attacks occurring in young subjects following the rapid ascent of a mountain, or after cycling, or some other strained effort, when no coronary

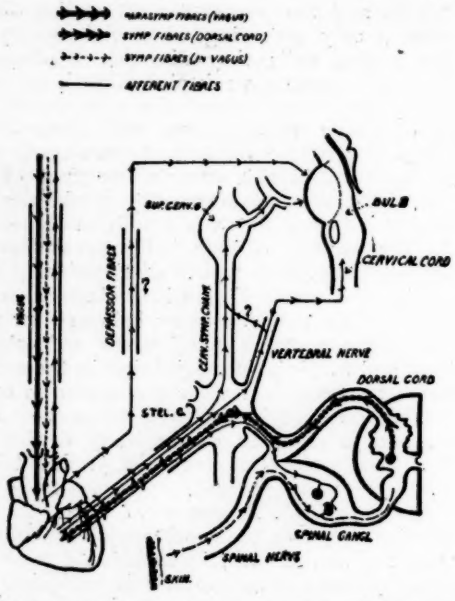

FIG. 1.—Efferent and afferent cardio-aortic nerves in man. The greater number of the accelerator fibres travel through the stellate ganglion and the inferior cervical ganglion; a small number pass by the vagus. *Moderator* fibres (parasympathetic) are present in the vagus, and sympathetic and parasympathetic fibres make up the efferent cardio-aortic nerves. The afferent (sensory) nerves are composed of the ascending and lateral groups. The path of the ascending group is not finally established, but it is thought that its fibres are scattered in the cervical sympathetic and its cardiac branches, in the vertebral nerve, in the vagus and its cardiac branches, and in the nerve of Hofer. It is necessary to cut as many of these sensory nerves as possible in angina. It is proposed, therefore, to divide the cervical sympathetic above the inferior cervical ganglion, the branches which, leaving the cervical sympathetic cord, run towards the neck, and also the nerve of Hofer when present. The ascending group contains two groups of fibres which are named pressor and depressor, according to their relationship with the cardiac and vascular centres and in accordance with the results obtained by stimulating their central ends. It is not established which nerves of the cervical region contain the pressor fibres and which the depressor fibres, but in view of the fact that the reflexes which appear in angina are mainly pressor in type, it is the more necessary that all the ascending sensory fibres should be cut. A note of interrogation has been introduced into the diagram at the side of the depressor fibres, not to indicate doubt as to their existence, but because it is just possible that there exists a separate nerve, exclusively depressor. The lateral group consists of fibres which traverse both the stellate and the inferior cervical ganglia and travel in the posterior roots. Their trophic centre is placed in the spinal ganglion, and they meet here (or in the cord, according to some writers) with the sensory cutaneous fibres.

disease was found at the necropsy. Moreover, this suggestion explains those cases of coronary disease without anginal symptoms, where the slowness of growth of obstruction in the coronary arteries has permitted the development of anastomotic channels, and the provision of a good blood supply. When an anginal attack occurs in a healthy heart after overexertion, there is present a condition of coronary insufficiency without coronary disease; in the case of extensive coronary obstruction without anginal attacks there is present coronary disease without coronary insufficiency. Furthermore, in cases of angina without coronary disease, but with subsigmoid aortitis only, the coronary orifice is often involved. Even when this is not so the loss of aortic elasticity leads to interference with the free functioning of the coronary orifice during systole. Whilst the hypothesis of coronary inflammation only explains a single class of cases, that of coronary insufficiency is applicable to all. When an anginal attack is precipitated by strain the failure of adjustment between the work to be done by the heart and the cardiac vascular supply is brought about by the increase in the work of the heart (quickened action with or without increase of arterial blood pressure) associated with an unaltered coronary circulation. When the attack comes on during rest the loss of balance is the result of a sharp diminution in the blood supply (brought about by coronary spasm), the heart's action remaining unchanged.

What, then, is the nature of the process which results in anginal attacks? I believe that the starting-point of angina is in the myocardium, more precisely in the left side of the heart, and I suggest that the process is analogous to that which is concerned in the fatigue of voluntary muscle. If a voluntary muscle is to continue working without ever tiring, its blood supply must be sufficiently good to remove all the toxic products of activity. If the blood supply is inadequate (as in the case of an increase in muscular work associated with an unchanged vascular supply, or, again, a decrease in the blood supply with no change in the work), the muscle after each contraction is incompletely emptied of the resulting toxic substances. The consequent intoxication produces muscle

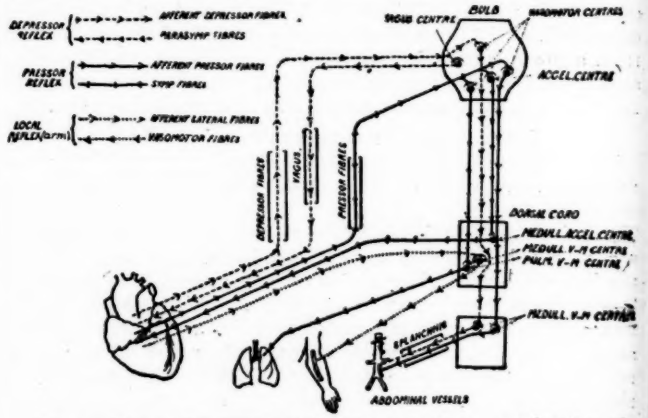

FIG. 2.—Plan of the pressor and depressor reflexes. Stimulation of the sensory nerve endings in the heart and aorta gives rise to two kinds of vascular reflexes—general and local. The general reflexes are of two kinds—depressor and pressor. The depressor reflex slows the heart and diminishes the force of its contraction by stimulating the nucleus of the vagus; it lowers the blood pressure by stimulating the vaso-dilator centre and bringing about abdominal vaso-dilatation. The pressor reflex quickens the heart, and increases the force of its contraction by stimulating the accelerator centres; it raises the blood pressure by stimulating the vaso-constrictor centres, producing a vaso-constriction, especially in the abdomen. In angina the pressor reflexes predominate; the more important local vascular reflexes are those which occur in connexion with the vessels of the arms, and especially of the left arm.

fatigue, evidenced by sensory symptoms (feelings of fatigue and pain) and motor symptoms (temporary paralysis). The sensory symptoms are due to the stimulation of sensory nerve endings, the motor to changes in the motor nerve endings, brought about by toxic substances accumulating in the muscle. It is likely that an analogous condition exists in the case of the anginal spasm. The inadequacy of the coronary blood supply, arising from one or other of the contingencies just mentioned, leads to myocardial poisoning and cardiac fatigue by a process analogous to that admittedly obtaining in the case of voluntary muscle. From this there result sensory symptoms (distress and anginal pain), and also motor phenomena (tachycardia, extra-systoles, alternating beats, etc.), which may end in the heart ceasing to beat. The former are due to the stimulation of sensory nerve endings in the myocardium, the latter to a change in the motor endings, which are very much more complex in the myocardium than in voluntary muscle, because of the presence of nerve ganglia in the heart muscle.

The sensory nerves of the heart and aorta play an important part in the development of anginal attacks. The depressor nerve is not usually taken into consideration as being one of these nerves, which is a great mistake.

Depressor fibres make up only a small part of the nerve tracts passing to these organs. These nerve tracts are numerous, but their exact course in man has not been finally determined. Several experiments on animals and some tentative surgery in the case of anginal patients support the following explanation, which will undergo radical modification later on with greater knowledge of anatomy and physiology.

Two groups of sensory fibres appear to exist, termed, in accordance with their direction, the "ascending" and the "lateral" group. (Fig. 1.) The ascending group is composed of fibres which travel upwards in various cervical nerves—the sympathetic chain, the vertebral nerve, and the vagus. Occasionally, moreover, a special nerve passes out of the thorax to end in the trunk of the vagus and the superior laryngeal nerve; this has been named the "depressor nerve" by Hofer, who has not, however, produced proof of its nature. It is also quite likely that some sensory nerve fibres of the heart and aorta travel in the cardiac nerves, which leave the cervical part of the sympathetic chain and the vagus nerve. The lateral group consists of fibres travelling in the rami communicantes, which unite the first thoracic and the last cervical ganglia with spinal nerves (eighth cervical and the four upper dorsal), and reach the corresponding spinal ganglia through the posterior roots of those pairs of nerves. According to some writers these fibres terminate in the spinal ganglia, according to others they enter the cord, becoming associated with the neurone of cutaneous sensation. Thus, after a certain point, visceral sensation has no separate path of its own, but is conducted by the channels of cutaneous sensation. In health the cardio-aortic sensory nerves conduct reflexes only; in conditions of disease, such as in angina pectoris, in addition to these reflexes, the stimuli give rise to anginal symptoms—pain, spasm, palpitation, etc.

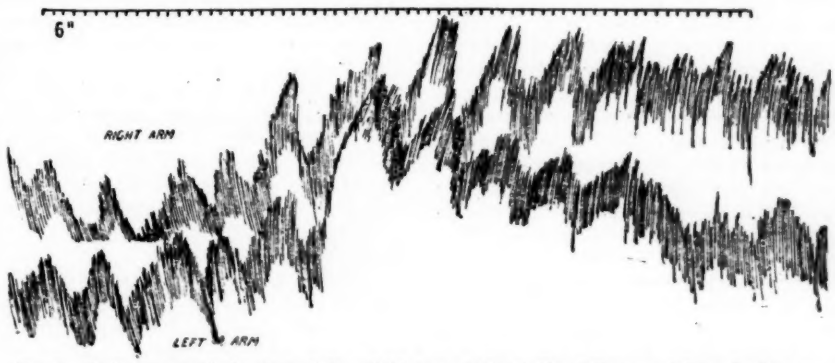

FIG 3.—Plethysmograph tracing of the right arm and of the left arm taken during an anginal attack in a patient who had had very many such attacks. The vasomotor oscillations are much more marked in the left than in the right arm.

The most important reflexes which arise in the heart and aorta in the case of an anginal attack are the vascular ones—the general reflexes are depressor and pressor. Depressor reflexes arise in connexion with the sensory depressor nerve fibres, which in man take the place of the nerve of Cyon, the bulb, and, as a centrifugal path, the parasympathetic. The pressor reflexes find their way along the numerous sensory pressor fibres in the cervical nerves, the bulb, and, as a centrifugal path, the sympathetic. The depressor group slows the heart, diminishes the force of myocardial contractions, and lowers the arterial tension, whilst the pressor group accelerates the heart, strengthens its contraction, and raises the arterial tension. (Fig. 2.) Various physiological experiments have shown that visceral stimuli unleash at once two antagonistic kinds of reflexes—pressor and depressor—but that sometimes the depressor effects (parasympathetic) predominate, sometimes the pressor effects (sympathetic). This rule has been frequently established in the case of the sympathetic nervous system. The increase of arterial tension, as also the quickened heart beat, which often accompany an anginal attack, lead to the belief that during the anginal attack the pressor reflex is predominant. With reference to local reflexes during anginal attacks, the plethysmograph has brought to light marked vasomotor oscillations in the arms, particularly in the left arm (Fig. 3); and an increased sensitiveness of the vessels of the left side to such drugs as amyl nitrite (Fig. 4), which act on blood vessels. Furthermore, Mackenzie describes contractions of pectoral muscles, which he classes as a "visceromotor reflex," but which would be better termed a "visceromyotonic reflex." Although general reflexes travel mainly along the ascending tracts, these local reflexes pass in the lateral tract.

Apart from these reflexes the sensory nerves carry the anginal sensations, particularly pain, and the feeling of anguish. The pain is referred to the skin, and can only be conducted along those sensory visceral filaments which are in anatomical relationship with the sensory cutaneous fibres. In man it is primarily the lateral group which enters the thoracic cord, but recollecting that stimulation of the central end of the nerve of Cyon produces pain, it must be inferred that there exist also ascending fibres which can conduct pain sensations, and which are to be found with the depressor and pressor fibrils in the nerves of the cervical region. These pain fibrils must come into connexion with the cervical cord, which perhaps explains the occurrence of pain in the neck and jaw. With regard to the feeling of anguish, the palpitation, and sense of oppression which sometimes accompany it, these have been shown to be felt in the heart itself and to be transmitted along the ascending tracts. Vascular reflexes play an important part in the production of angina pectoris. The surgical investigations of Coffey and Brown, of Eppinger and Hofer, have shown that section of the sensory ascending filaments (which, according to the first two authorities, pass by the chain of the sympathetic, and, according to the latter, by a separate nerve) prevents anginal attacks from occurring. From these facts very important conclusions are deducible with reference to the pathogenesis of angina. These results, which have the value attachable to actual physiological experiments, show that the cutting of these nerve fibres, which have no anatomical connexion with the skin areas to which the anginal pain is referred (chest, back, left arm), prevents an anginal attack from occurring. With this knowledge to guide us the following may be set out as the explanation of the development of an anginal attack.

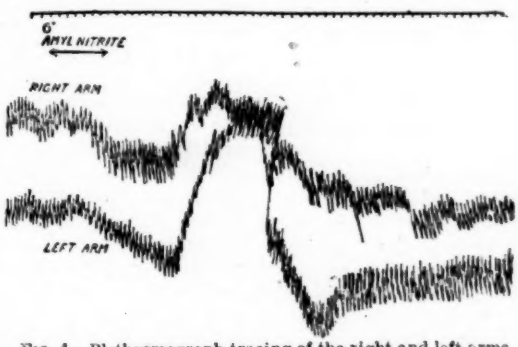

FIG. 4.—Plethysmograph tracing of the right and left arms. The vessels of the left arm are much more sensitive than those of the right owing to the action of amyl nitrite.

After the disturbance of the balance between the work of the heart and the coronary circulation there develops, as described above, an actual poisoning of the myocardium. Toxic substances accumulate and irritate the sensory nerve fibres in the myocardium. So long as the irritation is feeble no pain results, but only reflexes which undoubtedly pass along the two classes of nerve fibres, pressor and depressor. The fact that during an anginal attack the heart's action is usually quickened, and the blood tension raised, proves that it is the pressor reflexes which are predominating. This class of reflex can only intensify the myocardial poisoning, for it increases the work of the heart. A vicious circle is thus set up which stimulates increasingly the sensory nerve endings in the heart; when the stimulation is sufficiently acute, pain makes its appearance. Motor phenomena also appear (irregularities of beat, stopping of the heart), which are due to changes in the motor elements in the myocardium. To prevent the

formation of this vicious circle it would be necessary to close those sensory channels which conduct the reflexes, and this matter is dealt with later.

III. Why Anginal Pain Spreads Mainly over the Left Side.

The fine research work of Mackenzie on the anatomical relationship of the visceral and cutaneous nerve fibres affords an explanation of the reference of anginal pain to the skin. But this relationship exists on the right side as on the left. Why, then, does the spread of pain occur mainly over the left side? The explanation is that in angina the sensory nerves on the left side are more strongly stimulated. With regard to the centrifugal fibres (sympathetic and parasympathetic), it is known that the nerves on the left side pass to the left cavities, the nerves on the right to the right cavities. A similar arrangement must exist for the sensory nerves. The anginal pain is located mainly in the left side, and radiates over it because the cavities of the left side are being compelled to perform an excessive amount of work during the attack. It is the left ventricle, moreover, which shows the most extensive coronary lesions, and so the sensory nerve endings in the myocardium are rendered hypersensitive.

IV. Surgical Treatment of Angina Pectoris.

The surgical treatment of this condition has had hitherto a "bad press" because it has for the most part been employed empirically. Moreover, our ignorance of the precise path of the cardio-aortic sensory nerve fibres, and of the part they play in angina, prevents us from doing more than theorize. There are, however, some well established physiological data which must be taken into account when considering the surgical treatment of angina. It is known, for example, as a definite fact that the synapse of nearly all the sympathetic nerve fibres of the heart is situated in the stellate ganglion. We must therefore consider the results of removing this ganglion in a patient suffering from angina, whose myocardium is the site of extensive lesions, and whose left ventricle is being subjected to heavy work owing to the arterial hypertension accompanying this condition. Here will be found the explanation of many of the fatalities following extirpation of these ganglia in the operation of cervico-thoracic sympathectomy practised by T. Jonnesco, who, in his published reports, shows that this operation has been followed by death in three out of six cases. Another fatal case occurred recently, and Hofer in Vienna has reported a fifth, bringing the death rate to over 60 per cent. Death results, as I have shown in previous publications, from failure of the left ventricle, and, above all, from acute pulmonary oedema, Cervico-thoracic sympathectomy has been disastrous from the therapeutic point of view, but it has at any rate made it clear that removal of the stellate ganglion in angina is incompatible with life.

This operation must, then, be definitely abandoned, but the idea of surgical treatment of angina need not be given up; there is, indeed, reason to believe that it is the right line. I have suggested section of the cervical sympathetic chain. Coffey and Brown have practised this operation below the superior cervical ganglion combined with section of the first cardiac sympathetic nerve, and some benefit has resulted therefrom. Eppinger and Hofer have cut a nerve which takes its anatomical origin by two roots, one from the vagus, the other from the superior laryngeal nerve, and which passes towards the thorax. They term this a depressor nerve, but the physiological tests, which alone can establish such an implied function, are omitted from their investigations. On the contrary, the very definite improvement obtained in their cases by no means establishes the depressor function of this nerve, and it would indeed be likely that the closing of the safety-valve, constituted by the depressor nerve, would aggravate the anginal attacks by increasing the work of the heart. It appears more probable that this nerve contains a certain number of pressor fibres, and that only thus can there be an explanation of the benefit brought about in angina by the method of Eppinger and Hofer. In another quarter Stoehelin and Hotz have had good results from cutting the first cardiac branch of the vagus.

So it appears that the section of quite different nerves brings about the same result—namely, a distinct improvement in angina pectoris. This proves three things: (1) that all these nerves contain sensory cardiac nerve fibres; (2) that cutting some of the ascending fibres, without putting them all out of action, is sufficient to benefit angina; (3) that the abolition of the ascending nerve fibres, having no possible relationship with the lateral group, which alone explains the localization of the pain, can, nevertheless, prevent the occurrence of the pain syndrome of angina. These are the facts which suggest that there should be assigned to the ascending sensory group an important part in the originating of the anginal spasm; the reflexes, particularly of the pressor type, which they conduct, set up a vicious circle, which increases the irritation of the sensory nerve endings, giving rise eventually to pain. It is this vicious circle that must be prevented from developing, and this can only be done by cutting the ascending sensory nerve fibres through which the pressor reflex is produced. The primary factor is still operative, but the pressor reflexes being no longer produced, the sensory and the motor phenomena are scarcely apparent, and do not reach the point of causing pain, cardiac irregularity, or cessation of the heart action. Unfortunately, however, the ascending sensory fibres, pressor and depressor, are scattered through the nerves of the cervical region. Physiological experiments and operation results show that they are present in the cervical part of the sympathetic chain, the vertebral nerve, in the so-called depressor nerve of Hofer, in the vagus, including, perhaps, its cardiac branches, and in the cervical cardiac branches of the sympathetic. There is only one neighbourhood where they can be easily reached—the inferior cervical and first thoracic ganglia, through which pass nearly all the sensory nerve tracts of the heart and aorta. Experience has proved that in angina it is impossible to touch these ganglia without risk of killing the patient. Coffey and Brown, Eppinger and Hofer, Stoehelin and Hotz, have performed an admittedly incomplete section of the ascending fibres from which some improvement resulted; but is this benefit permanent? It is true that most definite results were obtained by cutting the nerve of Hofer, but in one case the anginal attacks were only decreased in intensity, and in another the attacks returned after a few months. This shows that the operation may be inadequate, which may be attributed to the fact that too small a number of sensory nerve fibres were cut. It is necessary to sever as many as possible of these ascending fibres, and such an operation is quite practicable. Of all the nerves which may contain these fibrils the vagus is the only one which must not be touched. The cervical sympathetic chain and the vertebral nerve can be cut above the inferior ganglion without any danger. The few cardiac accelerator fibres in the vertebral nerve, which come from the cervical cord, are of little importance compared with the large group of fibrils which leave the thoracic cord and pass through the stellate ganglion. Similarly, there is no danger in cutting the nerves which emerge from the cervical sympathetic cord above the inferior cervical ganglion and pass to the heart, containing perhaps some sensory fibres. It is further necessary to cut the special nerve described by Hofer, if present, which arises from the vagus and superior laryngeal nerve jointly and travels into the thorax.

To sum up, it is suggested that in angina pectoris there should be cut the cervical sympathetic cord, and the vertebral nerve above the inferior cervical ganglion, the nerve of Hofer, or any corresponding nerves present, and the nerves which spring from the cervical sympathetic cord above the superior cervical ganglion and pass to the heart. Thus, whilst preserving the important centrifugal nerves which are essential to the action of the heart, we are cutting the greater number of ascending sensory fibres to which is assigned an important part in the launching of the anginal attack. Only by this operation as detailed above can permanent benefit be obtained. The lateral sensory group which enters the thoracic cord is certainly left intact, but, as previously shown, this group is of only secondary importance. Since the principal site of the anginal attack is the left side of the heart, and it is the sensory nerves of the left side which are mainly affected, the operation must be

performed on the left side in the first place. Is it necessary to complete it on the right side? It would be difficult to give any categorical answer, but it is more than likely that in the majority of cases the operation on the left side would be sufficient. None of the surgical methods suggested can yet be considered the ideal; it is certain that cervico-thoracic sympathectomy must be absolutely abandoned, whilst each of the other methods has as yet done no more than establish a right to be considered in therapeutics. In the present state of our knowledge regarding the innervation of the heart and aorta in man it is only possible to outline a hypothesis, but research is proceeding. It is unnecessary to add that the hypothesis can be modified or even abandoned in the face of fresh facts if they show that it is faulty, but at the present moment the line of reasoning set out above is the only one that seems legitimate.

PROLONGED REST IN THE HORIZONTAL POSITION A FERTILE CAUSE OF PUERPERAL SEPSIS.

BY

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In the BRITISH MEDICAL JOURNAL of August 16th I read a leading article on ante-natal care in private practice, in which the following statement occurs: "Indeed, it is only too true that with the exception of the advances rendered possible by the advent of anaesthesia and of Listerism (chiefly in Caesarean section) there has been little progress in obstetrics during the last fifty years." This is a very strong indictment with regard to an important branch of medical science. But with regard to the preventive treatment of puerperal sepsis I am afraid it is only the absolute truth. No doubt antiseptics have proved to be excellent preventives, the records of the New York Maternity Hospital showing that since their introduction in that institution the mortality from puerperal sepsis has been reduced to nearly one-fifth of what it had been previously. But much still remains to be done to save innumerable valuable lives. Two things struck me forcibly when I was one of the visiting physicians to the Cork Maternity. One was the thorough contempt the patients in the lanes exhibited for the teachings of medical science with regard to the amount of rest that should be taken after a confinement. The other important fact was that puerperal sepsis was almost unknown amongst these women, though they lived in the midst of squalid poverty and in surroundings which were the reverse of sanitary. Since then, many times I have asked myself whether it may not have been a case of cause and effect. Did the early sitting up indulged in by these patients and their rising from bed at an early date to do their work all tend to prevent lodgement of the lochia in the uterus and vagina, and thus render them less susceptible to sepsis? When I was a student the teaching would almost imply absolute immobility in bed for the puerperal woman. Now things are more liberal, as it is considered quite orthodox for the patient to sit up when micturating. But I see one modern author would not allow his patients to leave their beds till between the tenth and fourteenth days, whilst others would keep them lying down till the eighteenth day. Whether this lengthened rest is necessary, or on the other hand injurious, is a problem still awaiting solution.

As I was anxious to know whether the poor in the slums of the city were still adopting the same methods as they did when I was a visiting physician to the Maternity, I questioned the present matron, who is a trained obstetric nurse, and as such had a good practice of her own prior to obtaining her present appointment nearly ten years ago. I elicited from her some very interesting and important information. She tells me that the average time extern patients remain in bed is four or five days, and she gave me the history of sixteen of these patients who were still under the care of the nurses when she was speaking to me. Five of them remained in bed till the fifth day only, but the other eleven considered that time too long and they got up the third day. On the third day when the nurses called to attend the eleven they found one of them washing a tub of clothes, another was scrubbing the floor, and another was gone to town, probably to bring home the marketing. And yet amongst the extern patients there was only one case of sepsis during the nearly ten years the matron has been connected with the Maternity. On the other hand, within the same period amongst the intern patients, who are much fewer in number, there were three cases of puerperal sepsis. All three were half sitting up during micturition and defaecation. One of the three sat up fully the third and every day afterwards, and she recovered. The other two did not sit up fully any day, and both died. Had the prone position nothing to say to the development and continuation of the sepsis in these cases? I will have more to say on the subject presently, but here I may mention that some years ago in a work on midwifery I read that the author had a case of puerperal sepsis, and the patient, contrary to his instructions, got out to the night-chair, and within a very short time there was quite a considerable drop in the temperature, probably due to the drainage of the uterus.

Before considering whether sitting up in bed at stated intervals may be an advantage or disadvantage for the puerperal patient, and before discussing whether prolonged rest may or may not be beneficial, we had better first study Nature's methods of defending the organism against bacterial invasion. First of all we have the vaginal bacillus, an efficient sentinel ready to attack any pathogenic bacteria that may have gained entrance through the ostium vaginae. But it is during labour that the most energetic forces are brought into play. At the end of the first stage the rush of the liquor amnii tends to flush out all bacteria that may be present. During the second stage the downward passage of the child's body tends to firmly brush them out. The expulsion of the secundines produces a similar result, and then the after-bleeding helps to complete the work.

Here, now, are some of the arguments that have been used against getting the patient at stated times to sit up in bed and against her rising early. We are told that she might get pulmonary embolism. But it is now asserted that pulmonary embolism, except in the presence of some complication such as sepsis, cannot occur later than six or eight hours after labour. Be that so or not, much would depend on the suddenness with which the alteration in position had been made. Again, though undoubtedly a formidable complaint, at least here in Cork it is of very unusual occurrence. I can recollect seeing only two cases. One died within about ten minutes; as a matter of fact I did not actually see her in the attack at all. The other was alcoholically inclined, and when I was resuscitating the child she suddenly sat up in bed and said we were paying all attention to the child and none to her. The attack came on at once, but she recovered, and I remember part of the treatment was the application of leeches to the precordium.

Another argument which has been used is that owing to the supporting ligaments of the uterus being soft and their lengthening remaining, and also owing to the uterus being heavy prior to involution taking place, prolapse would be likely to occur. I must own that even after starting this paper that seemed a puzzle for me, but I reflected that if things were as represented any number of the denizens of the lanes of the city should be victims of prolapsus uteri; and I asked myself, are the poorer women attending the gynaecological department of the Maternity more frequently suffering from this complication than the well-to-do patients coming to my study? I must say in this regard that I am inclined to think there is very little difference between these two classes of women. If the puerperal woman were left to her own devices surely she would wholly or partially sit up when micturating or giving the breast to the child, and I asked myself, Could Dame Nature, so careful in other respects, be so negligent of the puerperal patient as constantly to subject her to the risk of becoming a chronic invalid solely because she had fulfilled the high function of propagating the species? Further thinking led me to a solution of the problem. Here it is: the first day of the puerperium the walls of the uterus are nearly two

inches thick, and the fundus is five inches above the symphysis pubis. Consequently at this time we are dealing with a very bulky organ which is resting on the false pelvis and on the brim of the true pelvis. Even on the ninth day, the day on which many ladies get up, it is so comparatively large that the fundus is still an inch above the symphysis, and even when the uterus becomes a pelvic organ it must for some time be getting surrounding support. Clearly, then, during a very great part of the puerperal period there is no need for the suspensory ligaments to exercise their normal functions, and they can well afford to wait till they will have contracted sufficiently to enable them to do their work efficiently.

So after all Dame Nature is not the blind goddess some obstetricians would represent her to be, and I am afraid that we must dismiss as a figment of the imagination the oft-repeated statement that much sitting up in bed or the early rising of the puerperal woman gravely endangers her suffering from uterine prolapse.

In this connexion I may point out that it is known that certain uterine displacements are prolific causes of abortions, and if early sitting up in bed and early rising during the puerperium readily lend themselves to the production of these displacements, then we ought to have any number of abortions amongst the extern patients of the Cork Maternity. But what are the facts? Statistics indicate that something like 10 to 20 per cent. of all pregnancies terminate in abortions, and yet the records of the Maternity show that amongst the extern cases attended the number of abortions was a little less than 3 per cent. of the pregnancies. I recently questioned a gentleman who had been a prominent Government official in the Transvaal, as to the habits of Kafir women with regard to their confinements, and he told me that after the confinement they would be out working hard that very day in the fields; and he added that Kafir women are a healthy race. In answer to further inquiries, he said he never heard of a Kafir woman having puerperal fever, but he had heard of Europeans suffering from the disease.

I have now mentioned some facts that would tend to indicate that women who rise, perhaps, in some instances, too soon are less liable to be attacked by sepsis than women who remain lying down for a considerable time, and I think we might with advantage investigate this subject further. Judging from the energetic measures taken by Nature during and soon after labour to get rid of any noxious bacteria that may have found entrance into the genital tract, we may assume that an important function of the lochia is to wash out any debris that may have remained in the uterus after labour is ended, and we know that a piece of the membranes might be left behind unnoticed and, even though small, large enough to form pabulum for a whole colony of bacteria and a suitable nidus from which they could lay siege to the adjoining tissues. It would be almost an insult to intelligence to ask whether the bit of membrane would be more readily removed by the lochia when the patient is sitting up or in the prone position. Another function of the lochia is to flood out any pathogenic bacteria which may have gained entrance to the vagina or uterus, and the same remarks with regard to position apply to this. But that is not all. The dorsal decubitus causes the lochia to stagnate in pools in both the uterus and vagina, thus forming veritable forcing beds for the breeding of noxious bacteria. Furthermore, the lochia retained in the uterus, acting as a foreign body, interferes with adequate involution, leaving the cavity larger with freer entrance for the bacteria; owing to this subinvolution the uterine vessels and lymphatics are not adequately compressed by the muscular fibres, and the bacteria or their toxins can all the more readily get into the general circulation. Once puerperal sepsis develops this state of affairs tends to accentuate matters. For some years past I have been instructing my patients to sit up at stated intervals in bed, with, as I believe, good practical results.

Out of the mouths of babes comes wisdom, and poor women residing in the slums of Cork, who through force of circumstances felt compelled to ignore medical advice, have taught me what I consider a very valuable lesson.

British Medical Association.

PROCEEDINGS OF SECTIONS AT THE ANNUAL MEETING, BRADFORD, 1924.

SECTION OF OBSTETRICS AND GYNAECOLOGY.

JOHN S. FAIRBAIRN, M.B., F.R.C.P., F.R.C.S., President.

DISCUSSION ON DYSMENORRHOEA IN YOUNG WOMEN: ITS INCIDENCE, PREVENTION, AND TREATMENT.

OPENING PAPERS.

I.—ALICE E. SANDERSON CLOW, B.Sc., M.D., B.S.,

Cheltenham.

"DYSMENORRHOEA" is a word to which so many definitions have been given that it is necessary to state in what sense one is using the term. This entails an understanding as to what we mean by "normal menstruation." Experience has taught me that menstruation is a function which, when normal, has no symptoms. If there were not external evidence of it a large proportion of women would not know when it was taking place. This is the normal state of affairs. Suffering of any kind associated with the menstrual period is abnormal, and is included in the meaning of the word "dysmenorrhoea" as used in this paper.

INCIDENCE.

In support of the above statement with regard to normal menstruation I have obtained, during the last eleven years, the following figures, as the result of questioning over 2,000 healthy girls whose ages range approximately from 12 to 22 years. The information was elicited at the first interview after the onset of the catamenia. Of these girls, 1,830 were at a secondary school (in which the majority of the pupils were boarders), and were seen in the course of the annual medical inspection; the remaining 220 were students at a training college for teachers, at which I have been one of the medical officers for the last five years.

Having decided from the first that there can be only one line of demarcation between normal menstruation and dysmenorrhoea, I divided the cases into two main groups. In the first group (normal) I put those who stated that they had no pain or discomfort whatever during the period, or as they usually expressed it, "felt just ordinary"; also those who had, on very rare occasions, experienced some discomfort. In the second group (dysmenorrhoea) I placed all those who owned to any pain, however slight, or any feeling of malaise, such as headache or nausea, associated as a general rule with the menstrual period. This group I further subdivided under three headings according as the symptoms were "slight," "subacute," or "disabling." The result was as follows:

Number of girls questioned, 2,050.

Group I.	Normal		78%
Group II.	Dysmenorrhoea—		
	Slight	17%	22%
	Subacute	2%	
	Disabling	3%	

Of the type of dysmenorrhoea known as "spasmodic" I have only recorded five cases. It is remarkable how rare it is for any pain or discomfort to be experienced during the first two or three menstrual periods. Only three girls stated that this was the case.

The percentage of cases of dysmenorrhoea from my own investigations is much lower than that obtained from schoolgirls by the two observers quoted by Dr. Blair Bell[1] at the Congress of Obstetrics and Gynaecology last year. These figures (53 and 42 per cent.) were obtained from 268 and 500 girls by Dr. Marie Jacobi and Dr. Catherine Chisholm respectively.

Now the figure I obtained with the first 734 girls interviewed, as recorded below, was 46.7 per cent., which is about midway between the two percentages quoted above.

The reason for the marked reduction in my total numbers will be apparent later. Suffice it to say now that with the change in the school regimen with regard to exercise there has been a steady decrease in the incidence of dysmenorrhoea, even among those questioned on the subject for the first time. Also the average age of entrance to the school has been considerably lower during the last five years, so that the influence of the school customs with regard to the menstrual period starts, in many cases, at puberty.

I hope it may soon be recognized that it is quite unnecessary for as many as 22 per cent. of schoolgirls to be subject to a monthly recurrence of pain or discomfort. A study of the textbooks on gynaecology would certainly not lead one to the conclusion that menstruation is normally a painless process. I have not found one which does not give the impression that suffering must be expected to occur during the menstrual period.

It is difficult to see how gynaecological surgeons can acquire a first-hand knowledge of the normal menstrual process, when their time is occupied in dealing with pathological conditions. I would suggest that the only reliable statistics on the menstrual function can be obtained by medical women who have access to a large number of healthy girls and women in schools and colleges and industrial institutions. The importance of right teaching on the subject to medical students can hardly be overestimated, because on it depends the advice given to the mothers of the next generation. So long as the family doctor teaches that the menstrual period should be regarded as a time of semi-invalidism, so long will dysmenorrhoea continue to be a common complaint.

I notice that some gynaecologists do not consider menstrual pain worthy of the name of dysmenorrhoea, nor of treatment, unless it is so severe that a woman is incapacitated thereby. It is agreed by all that the disabling forms are rare compared with the less serious types of the complaint. The latter, therefore, are of greater importance from the national and industrial point of view. Surely any pain or discomfort endured during working hours must detract from the value of the work done; therefore, apart from any desire to alleviate the suffering of the individual, it is important that dysmenorrhoea, however slight, should not be disregarded, but should be cured if possible.

PREVENTION.

Since my girlhood I have known that normal menstruation is a painless function, and that not only can baths and exercise be continued with impunity throughout the normal period, but that dysmenorrhoea is usually thereby relieved, if not dispelled.

During my first year of medical inspection at the school which supplies me with my data, the rule, as in other boarding-schools, was that games and gymnastics and baths were discontinued during the first three days of the period. Those who felt so inclined were allowed to go out for a walk; the alternative form of recreation was to lie down and read a novel. In some of the boarding-houses the latter became the more popular procedure, with the result that an increasing number of girls did not feel well enough to continue the ordinary routine of school life. In many instances girls were kept in bed one or two days during menstruation, at the request of the parent or home doctor. This still occurs in a few cases. I was quite sure that these practices not only incurred a waste of time, but were a source of future preventable suffering. I therefore questioned each girl, who had arrived at the age of puberty, as to her feelings and habits at the menstrual period, and explained my views with regard to the hygiene of the period, instructing her to obtain consent from home before putting my advice into practice. The advice given corresponds with that recommended by the Council of the Medical Officers of Schools Association, which has been issued in leaflet form for distribution by headmistresses. It is as follows:

*Advice to Girls concerning the Monthly Period.**

1. The monthly period is not a malady but a natural function; you ought, therefore, at these times to feel quite well and to be free from pain or any unpleasant sensations.

2. The ordinary rules of cleanliness and hygiene should be observed as at other times. There is no risk in the use of soap and water, in spite of the usual prejudice against it; a warm bath should, if possible, be taken every day throughout the period; if this is not possible, you should wash the whole body, including the feet, with soap and water. There should be a daily action of the bowels, as at other times.

3. In order to grow up strong and well, it is necessary that you should have some exercise every day in the open air, such as a brisk walk or games. It is important that you should continue this exercise, as usual, throughout the period, as, by so doing, you will probably prevent the onset of monthly discomfort and pains later on. If you are troubled with slight headache or backache, or a sense of fatigue, or slight pain during the period, you should take a brisk walk or play games, or do some work in the house or garden involving bending movements of the body. If you give up all exercise, more especially if you lie down, your aches and pains will be prolonged and increased in severity.

4. If you feel ill at the period and are not able to carry on your usual occupation, your doctor should be consulted. Any ailments associated with the period are more easily cured while you are young than after they have been established for years.

The following table gives a summary of the results obtained at the inquiry at the school and at the training college:

	School.		Training College.	
	Years 1915-1920. 734 Girls.	Years 1920-1924. 612 Girls.	220 Students.	
	First Interview.	Last Interview.	First Interview.	Last Interview.
	Per cent.	Per cent.	Per cent.	Per cent.
Dysmenorrhoea—				
Slight	40.0	10.2	8.6	3.6
Subacute	1.6 — 46.7	0.5 — 10.8	7.2 — 19.4	1.6 — 5.6
Disabling	5.1	0.1	3.6	0.4
Occasional...	Not recorded	7.6	5.3	3.6
Rest during period	20.3	4.0	4.0	0.4
Baths during period ...	11.9	74.8	11.6	52.2
Games, etc., during period	36.7	84.1	69.5	82.2
Constipation during period	7.0	3.3	2.2	0.9

The method of grouping in this table, which is not based entirely on the girl's own description of her feelings, requires some explanation.

Slight Dysmenorrhoea.—In this group are placed all those who complain of slight pain or discomfort at the period, which is not severe enough to interfere with their work or games. It includes also some who describe their pain as "dreadful," but who, on being asked if it would deter them from playing hockey or going to a dance, say, "Oh, *no*! It is not bad enough for that."

Subacute Dysmenorrhoea.—In this class are grouped all those whose suffering at the period is enough to be apparent to others, or to interfere with any pleasurable pursuit, though they are not incapacitated by it.

Disabling Dysmenorrhoea.—Under this heading are grouped those who, on account of pain, headache, or sickness, are unable to keep about, even if they have to retire only for half an hour. It does not include those who lie down against their own inclinations.

Occasional Dysmenorrhoea.—In some dysmenorrhoea is experienced occasionally, perhaps once in six or nine months. In some cases there is no apparent reason; in others it is associated with illness, or temporary change of circumstances, such as travelling (which usually entails lack of exercise). Several state that they only experience pain in exceptionally cold weather. In many cases dysmenorrhoea occurs only in the holidays when rest is insisted upon during the period. These are potentially normal, and are not included in this group.

Baths during the Period.—By this is meant an ordinary warm bath, not a cold douche or swimming. The unwholesome belief that it is dangerous to wash below the neck at these times is still prevalent. Twenty-five per cent. of the schoolgirls have not followed the advice given in this respect, the reason, in most cases, being that the doctor at home has not given his consent.

Games, etc., during the Period.—This means the voluntary continuance of games such as hockey, lacrosse, cricket, tennis,

* This leaflet is issued by authority of the Council of the Medical Officers of Schools Association.

whether practice or in matches; also drilling, gymnastics, riding, cycling, or dancing. It is very striking that among the school children the desire to continue their games as usual is almost universal; yet a considerable proportion are still prevented from doing so by restrictions from home. Many have discovered before I see them that unless they get some exercise on the first day of the period pain is liable to occur.

Constipation is not common among these girls, but is more frequent during the period than at other times.

The first column of figures in the table is derived from questioning the schoolgirls during the first five years of the investigation, and were obtained at the first interview, before they had received any teaching or direct influence from me. Most of the girls had already been menstruating for two or three years.

The second column of figures was obtained during the last four years, at the last interview, of girls who had all previously received my usual advice with regard to the hygiene of the menstrual period. The majority of these were over 18 years of age. We thus get the longest time test available for comparison.

The second pair of columns of figures were obtained from 220 training college students. The number is too small to allow definite conclusions to be drawn, but is, I think, sufficient to be of some interest. The students stay only two years in the college, and the sets of figures were obtained from questioning them on their arrival and departure respectively.

The facts which are brought out by these two independent sets of figures are:

1. That the incidence of dysmenorrhoea has been reduced in each case, the total reduction being approximately 75 per cent.
2. That there has been a decrease in the number of those who lie down during the period, and a marked increase in the number who have warm baths and take their exercise as usual.
3. It will be noted that the total incidence of dysmenorrhoea is less among the students than in the case of the schoolgirls, in spite of the fact that the former are all over the age of 18, when dysmenorrhoea is more common than in earlier girlhood. The explanation of this is, I think, to be found in the fact that the practice of resting during the period when at home was less common, and the continuance of exercise was much more usual than among the schoolgirls. The students, as a whole, come from humbler homes, where it is not so customary to interfere with the natural activity of children during their menstrual period.
4. There is a decrease in the number of cases of constipation.

I am sure it is the practice of suddenly stopping all activity during the period, together with the associated idea of invalidism which it inculcates, that is responsible for the relatively high proportion of cases of dysmenorrhoea among women of the educated class. Notwithstanding the fact that its incidence has, I believe, been overestimated, I do not think there is any one factor which mitigates against the success of unmarried women in their various callings so much as this preventable source of monthly disability.

Although I do not know of any figures which confirm mine in this country, support of the practice I advocate is to be found on the basis of experience in America. Dr. Florence Meredith, in her article on "Functional menstrual disturbances,"[2] writes:

> "A physician who examined a large number of college girls ten years ago found that 75 per cent. had dysmenorrhoea quite regularly. At the present time out of 749 girls only 17 per cent. were troubled at all by pain at the menstrual period, and only about half of these regularly. . . . The reason for the decrease I believe to be, first, an improved attitude in the minds of the girls towards the menstrual function. For the most part they now consider it, as they should, a normal function, one which should not give them pain and not be anticipated as a time of invalidism. The second reason for the improvement is, I think, that girls are now indulging in a much greater degree of general activity during the period."

She also writes:

> "I have never seen a single girl harmed by any activity which she would normally take, or any kind of baths to which she was habituated, even cold ones, when taken straight through the period."

I can certainly corroborate this statement.

There is no doubt that the best means of reducing the incidence of dysmenorrhoea throughout the country would be to teach every schoolgirl the simple rules of hygiene of the menstrual period. If the medical profession, whom headmistresses are asking for guidance in the matter, were to follow the lead of the Council of the Medical Officers of Schools Association in its attempt to bring this about, I believe that, in one generation, there would be a marked reduction in the number of cases of dysmenorrhoea. I would suggest that the "Advice Leaflet" quoted above be distributed also among girls working in factories and other industrial institutions.

If dysmenorrhoea came to be looked upon as a disqualifying complaint in a woman worker, many of the cases which could be cured by exercise would disappear, and the others, instead of suffering in silence, would seek treatment from their doctors. Though some individual hardship would be entailed, the amount of suffering throughout the land would be very much reduced, and, with it, would be removed the chief source of the inefficiency of the unmarried woman worker compared with the man.

There is one suggestion I would make both with regard to schools and factories, and that is that private lavatory accommodation, with facilities for washing, should be accessible to girls and women during the period. The chafing and dragging caused by wearing the same sanitary towel too long often leads to abrasion of the skin with intense pain. I am sure that the sum total of suffering from this cause far exceeds that from dysmenorrhoea. It is a cause of absence from work and social engagements of women who have to spend many consecutive hours away from home, and deters schoolgirls from their games and drilling, and gives rise to the impression that menstrual disability of a more serious nature is commoner than is really the case.

Treatment of Dysmenorrhoea.

The treatment of dysmenorrhoea described in all textbooks, and faithfully adhered to by most general practitioners, is rest in the recumbent position, with a hot-water bottle to the abdomen, and drugs. If by this means the pain is not kept below the point of toleration by the patient, an operation for dilatation, or incision, of the cervix is performed.

My own experience is that not only is exercise prophylactic against dysmenorrhoea, but that most cases already developed in young women can be cured by the same means. In my opinion operation should not be performed, nor even suggested to the patient, until a course of treatment by baths and exercise, with a judicious administration of drugs, has been tried for at least six months and found useless. Patients have to be taught that the treatment of dysmenorrhoea does not consist in relieving the pain after it has begun, but depends very largely on the regulation of the health by daily exercise in the open air—the exercise to be continued throughout the period. I have found that the first essential in the treatment of a case of dysmenorrhoea is to eradicate any previous notions that menstruation is an ailment which requires nursing. In the case of young girls attention has to be paid chiefly to correcting the views of the mother; and often considerable time and patience have to be expended before this very important preliminary process is completed. There is no difficulty in convincing the children.

Having ascertained by routine examination that there is no evidence of disease or structural abnormality, I advise the patient to take a bath, when possible, at the beginning of the period, hot enough to flush the skin, and to continue this daily throughout the period; even after the onset of pain I know of nothing which gives relief so promptly. It is far more efficacious than the hot-water bottle, as is only to be expected. The daily exercise, which should involve bending and swaying movements of the body, should be begun some days before and continued throughout the period. The exercise should, if possible, take the form of work, or games, or sport, so that the patient's mind may be diverted from her condition. For a woman who is engaged in sedentary work all day, exercises done in the bedroom in the early morning will generally suffice, but in all cases it must be vigorous enough to promote a healthy glow or even gentle sweating. For nervous women I generally prescribe some mild analgesic for the first three periods, but often find it is discarded after the first.

It is exceptional to come across a girl whose dysmenorrhoea is not cured, or much relieved, by these means. Having once experienced the desired result no more encouragement, or treatment, is usually required. The patient keeps herself well. The failures have been in those cases where the patient cannot be persuaded to try what she considers too drastic remedies. The following is an illustration of this type of case:

A lady complained that two of her maids, both nearly 30, had to be sent to bed for at least a day every month. They had been troubled with dysmenorrhoea for many years, and, in spite of every care, the pains were increasing in severity. The patients were persuaded to face the risks of the hot bath, which gave them temporary relief, but efforts to make them take exercise failed entirely. I was assured that any attempt to keep about at all on the first day of the period turned them green. Drugs had no effect whatever. Treatment was therefore stopped and they resigned themselves to their suffering.

About two years later, during the second year of the war, they came to me for advice, saying that they were anxious to take up farm work in a neighbouring village, but that the condition of service was that no leave of absence was granted for any monthly disability. I encouraged them to go, and heard nothing more of them until they appeared after the armistice on account of an outbreak of scabies among their fellow workers. They had been free of all menstrual trouble. One of them had felt nervous at the beginning of her first period, when she was engaged for three hours throwing up large trusses of hay on to wagons with a pitchfork. To her surprise the usual pains did not develop, and she felt quite well; she had not had any return of the pain since. Her companion spent the first day of her period removing manure by means of a wheelbarrow from one part of the farm to another. The result was equally happy in her case. They said that none of the band of twenty women who were engaged by the same farmer had any time off on account of menstrual disability.

Another case of unexpected self-cure was that of a lady wintering abroad who, on the first day of her period, received an urgent summons home. She had, therefore, to rise from her bed and pack a large trunk (excellent exercise). This, she found, stopped her pain, which usually lasted for two days, and she travelled in comfort.

To show that active, outdoor life is not always prophylactic against dysmenorrhoea unless the activity is continued during the period, I will refer to one other case:

Nine years ago a lady farmer brought one of her pupils, a girl of 19, to me on account of dysmenorrhoea, which rendered her incapable of work for nearly three days. A dull, aching pain began on the day preceding the period. The menstrual flow for the first three hours was very scanty, and during this time the pain was agonizing and was accompanied by vomiting. When a freer flow was established the character of the pain returned to that of a dull ache. I gave the usual advice as to baths and exercise. The lady farmer informed me this spring that, after three months of the treatment, the patient had no trouble whatever, and she has never been able to detect since that time when the girl is having her periods.

I have no collective results of the treatment of the severer cases of dysmenorrhoea among the schoolgirls I inspect, as a few cases only have come under my own care. In the ordinary routine I refer cases requiring treatment to the medical men in charge of the boarding-houses. In my private practice I find it difficult to keep complete records. Patients fail to report progress, especially when there is no further trouble and they know that the remedy lies in their own hands. No doubt, as a general practitioner, I am consulted by a larger proportion of women suffering from the milder types of dysmenorrhoea than probably is the case with the consultant gynaecologists.

In a hundred consecutive cases of dysmenorrhoea in nulliparous women with no organic disease, of whom I have had subsequent reports, the following results were obtained from treatment by baths and exercise:

Fifty-nine were cured. Thirty of these had, in addition, some drug treatment for the first three months.

Thirty-two were relieved of the pain, but were conscious of some discomfort. Of these, twenty-two were helped by drugs.

Nine were no better. Six of these did not give the treatment a trial. Three of them were relieved after the backward displacement of the uterus was rectified.

One, on whom I did a dilatation of the cervix nine years ago, was temporarily relieved, but after eight years the incapacitating pain recurred. The patient has lately been treated by diathermy, which has relieved the pain as completely as did the operation.

The drug most usually prescribed has been ammonol. I have not prescribed extracts of ductless glands for dysmenorrhoea itself, apart from abnormal periodicity, or flow, or other symptoms indicating disorder of endocrine secretion. In eleven of the successful cases I prescribed small doses of thyroid extract, and in three cases a polyglandular preparation.

In most cases the pelvic examination was made per rectum without an anaesthetic. I have therefore no record of the frequency of pinhole os, cochleate uterus, or any minor deviation from the normal which might be found on vaginal examination.

Some observers have found that dysmenorrhoea occurs in 50 per cent. of all women, and that the commonest cause is under-development of the genital organs.[2] It would be interesting to know if any case so diagnosed has subsequently given birth to a full-term child. There is so much variety in the normal that I know not by what standard such a diagnosis is made. I presume that in the case of the ovaries it is based entirely on symptoms, and in the case of the uterus on physical examination. I have not recognized this condition except in the extreme cases, such as the infantile uterus; but these are rare, and, in my experience, have been associated with amenorrhoea more often than with dysmenorrhoea. How is it that Nature is found to fall short so frequently in the all-important genital organs in the female, who is otherwise well developed, and that there is no corresponding failure on the part of Nature in the male?

If the effect of treatment may be taken as an indication of the cause of the pain, it would seem that the cases cured by hot baths, exercise, or diathermy are due to congestion, since all of these measures have a stimulating effect on the circulation.

Exercise, the most easily obtained and effectual of the remedies, by giving employment to mind and body, helps also to eliminate the psychological factor.

The type known as "spasmodic dysmenorrhoea" is not so successfully dealt with by voluntary effort, especially when the case is of long standing; though there are several instances of complete cure. But the fact that no case, to my knowledge, has developed among the school or college girls who have continued their games throughout the period, suggests that the prevention of congestion during the early years of menstrual life is prophylactic also against spasmodic dysmenorrhoea.

The treatment of dysmenorrhoea, as it occurs to-day among industrial workers, is a subject well worth careful consideration.

In the *Journal of Industrial Hygiene* published in February last year, Dr. Samuel Meeker wrote a preliminary note on "Dysmenorrhoea as an industrial problem."[4] His opening statement is, "Dysmenorrhoea is the commonest of all female ailments." According to his findings there is an enormous loss of work from this cause in America. He puts in a strong plea for the more general keeping of menstrual records in industrial concerns and adequate treatment of sufferers. The records would be most valuable, but if the method of treatment he advocates were realized we should probably find that the incidence of dysmenorrhoea among workers would increase rather than diminish. The "necessary arrangements" he suggests are: a room with beds, a tactful nurse, a physician to be available for those who wish to see him, hot-water bottles or electric heating-pads, malted milk, etc., for hot drinks, and a selection of suitable drugs. Those things may be very comforting to a girl actually in pain, for whom I would provide a hot bath and a couch, but I would replace the hospital ward by an empty room or, better still, a court in the open air, where the girls are encouraged to go through a short course of exercises daily, the exercises not to be missed during the period. By some such means, prefaced by some teaching on the subject by a medical woman, I believe we should do away with the majority of the cases of dysmenorrhoea.

If all employers of female labour were to follow the example of the Gloucestershire farmer referred to above, in refusing leave of absence for menstrual disability, I am inclined to think that the extra hardship endured by the few would be well compensated for by the benefit conferred on the many.

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II.—LEONARD PHILLIPS, M.S., B.Sc.LOND., F.R.C.S.ENG.,

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I MUST congratulate Dr. Clow on her very excellent paper, a valuable contribution to a subject the pathology of which is but little understood.

I agree with much of what she says. For some years I have been treating patients along similar lines with very gratifying results. However, I would not go so far as to say that most cases of dysmenorrhoea without physical signs are curable by exercises and hot baths continued throughout the period. Unfortunately we find only too often that the pain persists in spite of careful hygienic treatment, and I can recall cases of intractable dysmenorrhoea in women athletes of the highest order. Sometimes hygienic treatment, drugs, and operation are all tried in turn and fail, and the patient is obliged to endure a constantly recurring and distressing ailment, or submit to a major operation such as hysterectomy.

There is no royal road to the successful treatment of all dysmenorrhoea cases. It is true that there is a definite clinical type of dysmenorrhoea dependent on faulty hygiene and curable by hygienic treatment, but there are other clinical types due to various causes, some of which are very imperfectly understood and which, in my experience, are not curable by hygienic methods of treatment, sometimes not curable by any method of treatment short of stopping the periods completely.

In a paper read before the Royal Society of Medicine last year I analysed the results of treatment in one hundred consecutive cases in my out-patient department, pointing out that various clinical types of dysmenorrhoea exist, each demanding its own particular treatment. With regard to the "hygienic type" it was stated:

"Dysmenorrhoea is frequently a disease of faulty hygiene and living. A large proportion of patients conform to a definite clinical type. They are thin, anaemic, poorly developed, hypotonic, with weak abdominal muscles, absent abdominal breathing, and faulty posture. They are frequently constipated, have visceroptosis or a bad circulation, and lead indoor lives with little exercise and less fresh air. Naturally the uterus is sometimes arrested in its full development and possesses a feeble musculature, easily exhausted if compelled to do much expulsive work.

"An exhausted muscle forced to continue its contractions gives rise to cramp and severe spasmodic pain, true alike of the heart, the gastrocnemius, or the uterus. Constipation has a bad influence, for a mass of faeces in the pelvis may act as a pelvic tumour pressing on the veins and aggravating the congestion and menstrual pain. Often complete relief can be obtained by improving the faulty conditions above outlined, in the following manner:

"1. *Establish the Correct Mental Attitude.*—The patient must be made to realize that the period is a *natural function*; she is not ill, and must bathe and take exercise as usual.

"2. *Correct Clothing.*—No constricting garments should be worn which are likely to impede the pelvic circulation; if corsets are adopted they must not do the work of the abdominal muscles.

"3. *Correction of Constipation.*—Plenty of water should be drunk and fruit eaten. Overeating is bad, but enough food should be taken to give bulk to the intestinal content; exercise in the fresh air, abdominal kneading night and morning, and a regular attempt to empty the bowels at the same time every morning should be insisted upon. Purgatives should be used temporarily only, and paraffin chiefly relied on, if possible, while a regular daily reflex is being established.

"4. *Exercise and Exercises.*—Walking, light Indian clubs, tennis, and hockey are recommended. The object is to increase the tone of the musculature of the abdominal wall, bowel, and uterus, to improve the general and local circulation, and so to produce improved nutrition and muscular development. Many patients do not realize that the abdominal wall contains muscle. They allow their corsets to do the work of the recti and obliqui, inducing visceroptosis, constipation, and defective abdominal breathing. They must be taught—to produce hardening of the abdominal wall at will; breathing exercises night and morning before a mirror, standing in the correct attitude; and exercises to develop the abdominal muscles, such as lying flat on the back, then raising themselves into the sitting posture, keeping the legs and heels in contact with the bed or couch. Leisure must not be spent in emotional recreation such as the theatre, cinema, or novel reading, but in walking or exercising in the fresh air.

"It is much less common to see robust women suffering from dysmenorrhoea. Make the patient healthy and strong and often you will cure the dysmenorrhoea. Too much emphasis cannot be laid upon the importance of faulty upbringing, surroundings, and development as a causative factor in dysmenorrhoea, and the need of improving these as a first step in treatment."

For some years now I have been interested in dysmenorrhoea without physical signs, and have kept careful notes of about four hundred cases. All these women had very definite and disabling pain, and most were sent to me privately or to hospital by their medical attendants after an unsuccessful trial of medical treatment. In my hospital out-patient department such dysmenorrhoea cases constitute between 10 and 15 per cent. of the total number of women seeking relief.

In the short time at my disposal I think it would be best to mention briefly some of the more important and less appreciated facts which have impressed me after an analysis of these cases.

1. *Hygiene.*—The majority of the patients lead inactive or indoor lives; "nurse," "typist," "clerk," "machinist," "leather-worker," are found constantly in the notes under occupation. In one-half of the cases constipation constituted a definite complaint. One-third of the patients were poorly developed, with weak abdominal musculature, faulty posture and breathing, anaemia and visceroptosis—the class so much improved by hygienic treatment.

2. *Clinical Types.*—Little attempt has been made in the past to divide cases into groups founded upon constantly recurring clinical similarities. The variations in the site, time, duration, and character of the pain are very great, and, together with varied general conditions and local findings, suggest the possibility of several causative factors in dysmenorrhoea, even though gross pelvic physical signs are usually absent.

3. *Physiological Dysmenorrhoea.*—It is so often stated that intrinsic dysmenorrhoea begins at puberty and recurs at each subsequent menstruation. Some cases do, but a greater number establish menstruation painlessly, the dysmenorrhoea developing several years later, and for no apparent reason. Moreover, many women have painless periods alternating at intervals with painful ones. The importance of recognizing this fact is obvious, for in such cases an organic or developmental fault cannot be adduced as the cause. If it were so we would expect the pain to start with the first menstruation and to continue with each subsequent period.

4. *Functional Dysmenorrhoea.*—I am convinced that there is a strong psychical element in some cases. I can recall a case of dysmenorrhoea in which operation had been advised, but it was found impossible to pass a sound or even a probe into the uterus, so the operation was abandoned. The patient was not informed of the fact; her dysmenorrhoea, however, ceased from that time.

Many articles are written in support of various methods of treating dysmenorrhoea, but the originator of the treatment is usually more successful than his followers. This is often because so much depends upon the personality of the doctor, and on the fact that he is interested in his subject, so taking pains and exercising patience, while confidently assuring his patient of the success of his treatment. It is never wise to mention operative treatment until other methods have been tried. The results of operations for dysmenorrhoea leave much to be desired, and cases in which dilatation, curettage, or anterior hysterotomy have failed, can sometimes be subsequently cured or improved by non-operative treatment.

5. *Obstructive Dysmenorrhoea.*—This is the oldest theory and the one most constantly decried at the present time. Yet there is an accumulation of facts suggesting the existence of an obstructive factor in some types of dysmenorrhoea. To illustrate the possibility of such a condition I would like to refer to two cases which came under my care. Both of these patients were married women suffering from leucorrhoea due to a badly lacerated cervix. Neither of them had ever suffered from pain at the periods. Amputation of the vaginal cervix was performed for the leucorrhoea. Subsequently severe colicky dysmenorrhoea, exactly similar to so-called spasmodic dysmenorrhoea, developed. In both cases it was found that some true acquired stenosis of the cervix had developed as a result of the amputation, and it was difficult to pass a probe into the uterus. Anterior hysterotomy was done in each case, and the dysmenorrhoea then ceased.

6. *The Relation of Age to Cure.*—The younger the patient when first brought under treatment the better the results; from 16 to 20 years of age the percentage of successes is high. Severe cases over 25 years of age are more difficult

to cure, and cases over 30 are usually intractable and constitute the bulk of the failures. Recently I was consulted by a woman in her thirties, who had been told when she was quite a young woman that nothing could be done for the menstrual pain, which she must endure throughout her life: after treatment her pain is now negligible. Often, however, this result cannot be secured in cases left so long untreated. It is important to treat cases early, to persist in the treatment, and not to abandon the patient to her pain. There are few other pelvic conditions in which patients are so grateful for an alleviation of their pain.

7. *The Question of Pelvic Hypoplasia in Cases of Dysmenorrhoea and the Uses of Ductless Gland Extracts.*—I think it is important to obtain a consensus of opinion on this subject, since individual and combined extracts of ductless glands are so frequently prescribed on the assumption that a moderate degree of pelvic hypoplasia exists.

I agree that it is difficult to make out a proved scientific case in favour of this theory, concerning which great diversity of opinion exists. It is maintained against it: (1) That it is difficult to estimate accurately the size and degree of development of the uterus by ordinary methods of bimanual examination. (2) That in cases of so-called incompletely developed uterus the sound usually passes the normal distance. (3) That these uteri, when inspected through an abdominal incision, do not appear to be as small as one would expect from the bimanual examination. (4) That all uteri are not made to one constant pattern, and that variations within limits are possible in the normal case.

On the other hand, gynaecologists with out-patient departments are familiar with a common type of case in which the cervix is very small, the anterior lip almost absent, the anterior vaginal wall short, the fornices less roomy than the vaginal introitus, the uterus less bulky than in most nulliparous women, or else retroverted or acutely anteflexed. These cases are often associated with amenorrhoea or with long and irregular intermenstrual intervals. Dysmenorrhoea and sterility are commonly present and combined. The male type of pelvis and pubic hair may also be noticed. Personally I believe that a moderate degree of arrested development is fairly commonly met with amongst gynaecological out-patients, though how frequently it occurs outside hospitals in apparently normal women I do not know.

In four hundred of my cases of bad dysmenorrhoea one-third occurred in married women, and practically all were sterile over periods varying from three to seventeen years. There are two very suggestive facts in favour of an endocrine basis in some dysmenorrhoea cases: (1) the well known association of dysmenorrhoea with sterility, a fact emphasized many years ago by Matthews Duncan; (2) the remarkable success of organotherapy in some cases.

Though often disappointing, the administration of extracts of ductless glands is sometimes extremely encouraging. In some cases remarkable results are produced in a most dramatic manner, and patients are deeply grateful for the relief. I have some who remain free from pain while they take thyroid extract just prior to the period. *Cases with long and irregular intermenstrual periods and scanty flow sometimes derive much relief from combined extracts of ductless glands*, especially thyroid, ovary, and pituitary. Again and again in such cases (associated as they often are with small uteri) the administration of polyglandular extracts is followed by regulation and stabilization of the periods, and ultimately by pregnancy and childbirth, with its frequent cure of the dysmenorrhoea.

8. *Operative Treatment of Dysmenorrhoea.*—It is important to realize that drug treatment as practised at present is palliative only, requiring repetition at each painful period. On the other hand, operative treatment may be curative and permanent, though the percentage of permanent cures is not high. In an analysis of two hundred cases subjected to operation I found that 25 per cent. were cured, 25 per cent. improved, and 50 per cent. were unaffected or made worse. It is important, therefore, not to guarantee a cure when recommending operation in cases of dysmenorrhoea. The operations performed were: (1) dilatation alone; (2) dilatation with insertion of a hollow glass stem for varying periods; (3) dilatation and curettage; (4) anterior hysterotomy.

Dilatation gave the best results when performed in young women with central suprapubic spasmodic pain only, and when divulsion rather than dilatation was performed.

Curettage gave the best results in married women, especially when menorrhagia was present or casts expelled.

Hysterotomy proved valuable in acutely anteflexed undersized uteri, especially when the clinical picture suggested an obstructive causal element. At first I was encouraged by the results of this operation, but I now regard it as of no greater value than curettage, except in the special type of case mentioned above. Moreover, it is an extremely difficult operation to perform. The cervix as a rule can only be pulled down very little, and the operation is done through a narrow virgin vagina. It involves division of the vaginal mucous membrane in the anterior fornix, upward displacement and retraction of the bladder, and bold incision of the cervix right up through the internal os. In some of my own cases I applied the well known operation of pyloroplasty to the cervix uteri, dividing the muscle with a knife or cautery and leaving the mucous membrane intact.

9. *Drug Treatment in Dysmenorrhoea.*—The following drugs were tried:

1. Guaiacum resin in a 10-grain pill t.d.s. for seven days before the period, with antispasmodics during the period.
2. Pill, tannate of cannabin, 4 grains, t.d.s. for seven days before the period, with effervescing phenacetin repeated frequently during the pain, if it develops.
3. Aspirin, pyramidon, phenazone, caffeine, gr. iv of each suspended in mucilage, repeated two-hourly up to six doses. This gives very great relief as a rule, and is especially valuable in cases of spasmodic recurrent attacks of acute pain spread over one day.
4. Atropine sulphate 1/120 grain t.d.s. in cases of intermittent colicky pain extending over one or two days.
5. Mist. benzyl benzoate (Martindale).
6. Liquor sedans (Parke, Davis).
7. Tincture of apiol 3 to 6 minims in solution or in capsule in cases of scanty flow.
8. Potassium bromide gr. x and sodium salicylate gr. x t.d.s. before the period, with luminal 1/2 gr. during the pain, repeated judiciously up to the point of drowsiness, especially in cases allied to migraine.
9. Tincture of pulsatilla minims x, extract of caulophyllin liq. minims xv, t.d.s. during the period.

The best results were obtained by the use of coal tar antispasmodics with atropine, liquor sedans being sometimes added with great advantage. In many cases of recurrent acute pain of short duration palliative treatment is essential, because hygiene, organotherapy, exercises, and baths do not prevent the onset of pain, and exercises during the pain are not tolerated.

10. *Radium Treatment as an Alternative to Hysterectomy in Severe and Intractable Cases.*—Women in the thirties suffering from severe and intractable dysmenorrhoea have often in the past been treated by hysterectomy when other and lesser measures have failed. I believe that the insertion of radium into the uterus, with a consequent cessation of the periods, provides a simpler, safer, and yet equally effective alternative. An insertion of 100 to 150 mg. of radium for twenty-four hours is usually sufficient. It acts locally by producing fibrosis of the stroma and atrophy of the glands of the endometrium—facts proved by histological examinations of uteri removed subsequent to radium insertion. It is not, in my experience, followed by obesity, distressing symptoms of an artificial menopause, or by any reduction of the sexual sense. In some cases the menstrual loss has subsequently returned with little or no pain. I have tried this treatment in a limited number of private cases, but this number is naturally too small to form a basis for a general recommendation.

Hysterectomy is a major operation with a definite mortality and certain risks. With radium treatment the mortality is negligible apart from the risk of the anaesthetic. There is an increased risk of subsequent sterility which should be explained to the patient, but it must be remembered that in any case bad dysmenorrhoea is commonly associated with sterility, and that women requiring radium treatment are mostly at an age when the chances, possibilities, and desires for childbirth are diminishing.

In conclusion, I would like to emphasize that dysmenorrhoea has not one cause, nor yet one golden road of successful treatment. Every case requires careful investigation in order to discover the underlying causal conditions, and to evolve from these a rational treatment.

GENERAL DISCUSSION.

Mr. E. B. TURNER (London) spoke as one who had been through the mill in regard to the treatment of dysmenorrhoea. In the course of his long practice he had been accustomed to see about twenty-five women patients to every one man. He had been taught as a student the regimen of the couch, drugs, and so on—the bath in those days was unthinkable. Then about thirty years ago he had known a lady who was a great cyclist; he was surprised to find that her period made no difference to her activities. This made him think of the many women he knew who had to go to bed during that time. Then he became connected with an institution, and found that athletic girls went through the whole course of their training without any trouble. One very active girl started pain and flooding when she stopped games and exercise on taking up a sedentary occupation. Resumption of exercise led to immediate improvement. For years now he had advocated baths and exercise. He looked after a large girls' school and a hostel for young women, and he had been striving to set aside the prejudices of mothers regarding this point; in consequence dysmenorrhoea in these establishments had decidedly diminished. He was certain that if the doctrine of healthy exercise could be spread among all girls dysmenorrhoea would almost disappear, especially if they were taught young. One of the chief reasons why in Government departments the pay of women was not equal to that of the men was on account of the number of days they lost owing to menstrual trouble. The exercises recommended must be sensible and in accordance with the girl's individual strength. His experience was that girls who suffered from dysmenorrhoea generally had a bad time at their confinements. Ordinary games did a girl no harm, either at the time of the monthly period or in subsequent pregnancy.

Dr. CATHERINE CHISHOLM (Manchester) congratulated Dr. Clow on her paper and the conclusions, which, as regards evidence and prophylaxis particularly, were practically the same as she herself had published in her thesis in 1912. All who had studied dysmenorrhoea among normal girls rather than in the consulting room were in agreement that dysmenorrhoea even of slight character occurred only in a minority of cases. In her opinion it was found among delicate and weak girls rather than among strong ones; it was apt to develop when and if the normal health deteriorated, and to improve with the improvement of the general vigour. The practice of games and outdoor activities, bathing, and all hygienic exercises was therefore naturally of advantage. In her original figures of 500, gathered at a high school in a big town, the number disclaiming any disability of any kind at the monthly time was 58.6. Lately she had collected a further 500 figures. In the interval a generation had grown up which had been advised on the lines which Dr. Clow had described: the figure had improved to 66.78. Among the senior students who excelled in games as well as in mental work the original figure was 70.4. Among the anaemic and debilitated—that is, girls with less than 80 per cent. of haemoglobin on the Tallqvist scale—only 47.5 were free from menstrual disturbances. In cases with a tendency to menorrhagia as obtained occasionally in the adolescent, but not as frequently as one expected, the amount of dysmenorrhoea was comparatively high. Among 437 training students picked in health, and practising games as a general rule, the figure was 89 per cent. of freedom from dysmenorrhoea and even slight pain. In the case of another high school where games were a much more regular and integral part of school life than in the Manchester school the freedom was well over 90 per cent. on careful questioning. A large proportion of these girls were very young.

Of 100 adult cases collected for comparison in 1912, and consisting of a very mixed set of women, teachers, doctors, nurses, etc., the freedom from dysmenorrhoea was only 23 per cent. On investigating the manner in which pain began in these cases many confessed that as school children they had little if any pain. Thus apparently a large amount of pain developed during menstrual life, and if the cause of this development were to be discovered much suffering might be relieved by prophylactic treatment. The adult women she had questioned in many cases volunteered the information that with exercise they were much better. The frequency with which varicose veins and piles were found in women following sedentary occupations would lead to the assumption that in the pelvis a similar passive congestion took place, which would be particularly full as the monthly cycle culminated. Another factor in the production of pain was apparently mental strain.

In dealing with dysmenorrhoea they had, then, two types: (1) That which occurred with the onset of menstrual life, which was comparatively rare; it might be due to developmental defects or malpositions, which had to be treated accordingly. (2) That which developed later and which was a symptom of something wrong in the general health. Once it occurred it was liable to persist unless treated. Dysmenorrhoea formed a vicious circle: it exhausted the already tired individual, and the psychical suggestion that it was to be expected each month did the rest. Prophylactically, then, they should encourage the young and healthy girl to carry on her normal activities, having first ascertained that the amount she was called upon to do mentally and physically was well within her power. This was important for the school medical officer, and she had very different problems to deal with in the boarding-school, the town secondary school, and in industrial life. Exercises, etc., were most important aids to healthy life, but they must not add them on as an extra strain to the already overburdened life of the schoolgirl, with her train journeys, her musical practice, and her social duties in the home. Some adjustment must be made; nor must they encourage school authorities or school medical officers to force all girls to play during the monthly time when they did not feel fit. Dysmenorrhoea was pathological, and exercises ordered for it must be graded according to the extent and cause of the disorder, or a worse condition would follow with the swing of the pendulum towards the compulsory practice of games. Girls with profuse menstruation must not play till their flow was regulated. Girls anaemic and exhausted must first be treated intermenstrually with tonics, given light work, and little if any exercise at the monthly times till their muscular and nervous tone had recovered. Girls with severe pain must be given analgesics for a time during the beginning of treatment; the suggestion being constantly held before them that they would within three months lead a normal life. Irregularity must be treated with endocrine therapy where other indications justified this. The important thing was to persuade mothers and family doctors to regard even slight degrees of dysmenorrhoea as worth serious attention and careful treatment, since in this way much useless physical suffering could be avoided.

Dr. RHODA ADAMSON (Leeds) said that her experience of dysmenorrhoea and its prevention fell under three headings: (1) the treatment of cases of dysmenorrhoea already established in patients of her own private practice; (2) the observation of students taking a four years' university course—of these there were sixty new admissions yearly; and (3) working women who undertook work in connexion with an engineering factory during the war—about four thousand. The patients in Classes (1) and (2) in many cases had lived an unhealthy life and had frequently followed the course described by the opener. In most cases the dysmenorrhoea ceased or was alleviated by regular baths, exercise, and attention to bowels. In a very small proportion it had persisted, and had called for further treatment by tonics to improve the general health, and analgesics, especially coffee and ammonol. The small fraction of all cases who continued unrelieved by these means had come to operation—either dilatation and curetting or treatment by diathermy. Of the two she personally had a preference for diathermy. Class (3) only exceptionally suffered from dysmenorrhoea and very rarely required drug treatment, though there might be need to advise a little more personal cleanliness, etc. Dr. Adamson had had the opportunity in many cases of persuading the mothers of several girls in a family to alter completely their routine care of the younger ones with the onset of menstruation. In each case the younger girls had been better in health, and the mothers had been convinced of the advantage of the continuation of daily baths and regular exercise. The next generation should suffer less than girls had done in the past.

Dr. MINNIE L. C. MADGSHON (General Post Office, London) said that in the Post Office there were over ten thousand women of ages varying from 14 to 60 employed on different kinds of work with varying times and under different conditions. She was not able to give the exact amount of time lost on account of dysmenorrhoea, but the average amount of time lost from all causes, minor accidents and illness, was under two days per officer per year. She thought that a very generous estimate of time lost on account of dysmenorrhoea would be one and a half days per officer per year. Apart from the loss of a whole day they had to reckon with a certain amount of time spent in the sick bay—from an hour at a time up to half a day. The total average time so spent worked out at two hours per head per year. She had kept a record of the occurrence of dysmenorrhoea in girl probationers when they were examined on entrance to the service between the ages of 14 and 15. The results of this she had set out in the following table:

Examination on Entrance (14 or 15 Years Old).

Group.	Total.	Menstruation not Started.	No Pain.	Pain, but no Rest required.	Pain requiring Occasional Rest.	Pain requiring Frequent Rest.	Totally Incapacitated.
A*	488	18.6	66.5	27.5	4.0	1.3	0.3 (1 case)
			94.0				
B†	506	28.2	82.4	14.0	3.9	0.3	Nil
			96.4				
C‡	1,123	40.8	81.0	13.2	3.4	0.7	0.2
			94.2				
D§	807	27.0	76.7	17.0	2.9	0.5	Nil
			93.7				
Same Girls Re-examined One to Two Years Later.							
A	362	0.3	65.3	26.7	6.5	0.9	Nil
			92.0				
B	346	4.6	66.8	26.7	6.1	0.3	Nil
			93.5				
C	526	6.8	67.0	26.8	5.9	2.0	Nil
			93.8				
D	589	2.4	68.5	24.9	5.6	1.0	Nil
			93.4				

* Pre-war. † First two years of war. ‡ Second two years of war. § Since 1920.

From this table they would see there were only two cases of total incapacity on account of dysmenorrhoea among three thousand girls. In regard to treatment she would say very little as it was not the subject on which she had been asked to speak, but she had found that a course of iron was the best curative, the course to be spread over from six to twelve months. Their sheet-anchor palliative had been a mixture containing spirits of chloroform and red lavender. She thought that the greater proportion of suffering from dysmenorrhoea occurred between the ages of 20 and 30.

The PRESIDENT, inviting other speakers to take part in the discussion, expressed his gratitude to the medical women officers of institutions for the very valuable statistics they had so carefully compiled. He thought that Bradford, which was a very large centre of the textile industry, was a particularly good locality for the discussion of the subject they had before them, as with the employment of so many women in industry there should be useful data to be obtained in the neighbourhood.

Dr. M. E. WESTON (Leicester) gave figures collected at school inspections. She had found that the average age for the onset of menstruation was 13 years and 8 months. There did not appear to be any difference in regard to dysmenorrhoea between those starting early and those starting late. Two girls who had started at the age of 10 were no worse than others who started at the normal age. In her records only 3.5 per cent. suffered from pain or discomfort, and 40 per cent. of those had constipation; 4 per cent. of the total number had profuse menstruation, and 3.5 per cent. suffered from really severe pain. The time covered by her investigation was three and a half years. In the days before medical inspection was started the general rule had been no baths, no gymnasium, no games during the first two days of the period. Many mothers had stopped their daughters from bathing one week before the onset so as to be on the safe side. One mother had even complained of her daughter having to wash her hands in cold water when she was menstruating. Since medical inspection the general rule was hot baths for all boarders; one school allowed a hot bath at any time of the day to any girl who complained of severe pain. As regards exercises, she had barred gymnastics, hockey, and net-ball, all other kinds being permitted. She thought that perhaps a little restriction like that would give to parents more confidence that the medical officer was competent to give advice on this subject. In the elementary schools absence on account of dysmenorrhoea had been negligible until recently, when the age for leaving school had been raised. It was found now that a large number of mothers kept their girls at home while they were menstruating, not on account of illness, but from a feeling of modesty; they did not think it right for their girls to mix with others at such a time.

Dr. W. A. POTTS (Birmingham) thanked Dr. Clow for her valuable paper, and asked whether she made any rules about sea bathing; also if she found the mentality was affected during menstruation. In those cases where hygiene and physical treatment failed he would like to put in a plea for psychological treatment, properly carried out by a psychologist, and continued for a sufficient length of time. Of course, all necessary physical treatment must be carried out first, but when that had been done it should be realized what a serious step it was to operate when pain was the only symptom.

Mr. ALECK BOURNE (London) paid a cordial tribute to Dr. Clow's paper and to the important and valuable work of medical women in this branch of gynaecology; only since dysmenorrhoea had been investigated on these lines had they obtained rational ideas of the conduct of this function. Two broad classes of dysmenorrhoea were met with in practice: first, the large class of artificial menstrual invalids, the result of the teaching of wrong ideas in adolescence; and secondly, the small group of real pathological dysmenorrhoea. The first group were difficult to treat, according to the age of the patient—difficult over 25 and almost hopeless over 30. The second group should be regarded from the pathological point of view, and treated according to requirements. Polyglandular extracts were of real value when hypoplasia was present.

Dr. J. J. HOLLAND (Western Australia) was under the impression that the bulk of menstrual pain was ovarian in origin. Where he lived they had very few women doctors, so that no statistics had been collected comparable with those which had been laid before them. He had asked bank managers and business men who employed both men and women how the women compared with the men as workers, and had been told that as a rule the women were better workers, but that they were a nuisance about the time of the monthly period. As to time of onset, his experience had been that dysmenorrhoea did not come on till girls gave up active school life. He thought that this had some bearing on the figures which had been put before them that day. He could not understand why curetting should be done in the absence of definite symptoms, since the pain was not uterine but ovarian. He would like to know whether Dr. Clow had questioned her girls on the subject of regularity. Did improvement in pain and greater regularity go hand in hand? There was no doubt that in many women menstrual pain was relieved by marriage, and that those who were unrelieved often remained sterile.

Sir MALCOLM WATSON (Federated Malay States) spoke, not as a consultant, but as a general practitioner in the tropics. He claimed to be a general practitioner in the widest sense: his practice had been amongst numbers of

Europeans and thousands of natives. He had found that white women nearly always developed severe flooding in tropical climates. He had been in the habit of treating this by rest and continued doses of ergot and nux vomica. From what he had heard that day he was evidently on the wrong lines, and when he went back he would try to persuade these white women to take more exercise. It was well recognized in the tropics that men who took violent exercise were fitter, and kept fitter, than those who did not. In regard to Asiatics, he was concerned with plantations where boys and girls began work about the age of 10. He had often wondered how much silent suffering was going on among these workers, especially in the women at their periods. He was glad to hear that it was probably a good thing for these women to work as they had been doing.

The PRESIDENT welcomed the very great help they had received from the women doctors in making them look at the subject of menstruation with a greater sense of proportion. At a recent meeting he had attended he had been asked to believe that two-thirds of all women had their pelvic organs misplaced and suffered dysmenorrhoea in consequence. He thought that specialists did not gain a proper view of this subject, as they saw the pathological cases only. The teaching of hygienic methods was extremely important. It was odd that he had never yet come across a woman who both passed a membrane and suffered from dysmenorrhoea at the same time. He had met with women who passed membranes and women who had dysmenorrhoea, but never the two combined in the same patient. It was idle to speculate whether the pain was uterine or ovarian: it might be part of a general metabolic disturbance, and it was on this theory that endocrine preparations were tried. He thought that the difficulty in the treatment of dysmenorrhoea in older women was that they had had so many recurrent painful impressions that it was extremely difficult to eradicate them.

Dr. A. E. SANDERSON CLOW, replying to the questions submitted by Dr. Potts, said that for aesthetic reasons sea bathing must be vetoed during menstruation. The actual bath would do no harm; a cold bath did no harm. She had been told of chills coming on after bathing being followed by prolonged amenorrhoea, but thought that there must be some other contributing factor in these cases, since she had come across women who had accidentally bathed as menstruation was coming on with no bad results at all. She said that the girl's mentality certainly might be affected during her period. Mistresses had told her that some girls became very depressed and others became very irritable. She was quite sure that exercise and psychological treatment combined would cure a large number of cases. She agreed with Mr. Bourne that it was much more difficult to convince the mothers than the girls themselves. She had been very interested in what Sir Malcolm Watson had told them; she supposed it must be very difficult to get women to take exercise in the tropics.

IMPERFECT URINARY CONTROL FOLLOWING CHILDBIRTH, AND ITS SURGICAL TREATMENT.

BY

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A VERY considerable number of women who have borne children suffer from more or less marked inability to control the urine under physical strain. The condition is most often found in association with cystocele, but may be present when there is little or no sagging of the bladder. It is a symptom which is very often not mentioned, and is only elicited on direct questioning of the patient. My attention was called to it some five years ago, and, since then, every gynaecological patient coming under my care has been specifically questioned on the point. In a series of 63 cases of cystocele operated on by me in the Toronto General Hospital incontinence of urine on straining, laughing, or coughing was mentioned in only 19 of the histories, but on sending a questionary to the patients eighteen months ago it was found that 22 others had suffered in the same way prior to operation, making a total of 41. In 21 private cases 18 had incontinence of urine, and in 99 cases operated on in the Royal Infirmary, Edinburgh, in the last eighteen months 61 suffered from lack of urinary control. Thus in a total of 183 cases of cystocele, incontinence of urine was present in 120, or 66.1 per cent. I believe that the percentage is still higher, for a number of our histories were proved to be incomplete and a number of the patients did not reply to the questionary.

It seems strange that a symptom so distressing should not always be voluntarily mentioned when it is present, for the least extra physical exertion, such as lifting a weight, making a sudden movement, stepping up on or getting down from a tramcar, coughing or laughing, may result in the uncontrolled escape of a few drops or of quite a stream of urine. The same lack of sphincteric control is occasionally present in nulliparous women, but it is very much rarer in them than in those who have borne children. I gave a preliminary communication on this subject to the Obstetrical and Gynaecological Congress in Edinburgh in April, 1923: that communication was not published in full. In the autumn number of the *Journal of Obstetrics and Gynaecology of the British Empire*, vol. 30, No. 3, Victor Bonney contributed a most valuable article on diurnal incontinence of urine in women. His article concluded with a paragraph in which he stated that, from the short epitome of my paper which he had seen, he believed that our views regarding the condition were identical. To show that this belief was justified let me quote verbatim from what I wrote at that time:

"In all patients presenting this symptom I have found that there is a marked sagging of the neck of the bladder away from its proper situation behind the pubes—very often there is a marked sagging of the whole of the anterior vaginal wall and bladder in the form of a cystocele. In many, however, the cystocele may not be pronounced, or absent. In some cases of complete procidentia where both vaginal walls are completely everted control may be perfect; in such it will be found that the neck of the bladder remains braced up in its normal situation. The sagging of the neck of the bladder away from the back and under aspect of the symphysis is very easily demonstrated by introducing a catheter or sound into the bladder: on exerting a little pressure the lower end of the anterior vaginal wall can be made to bulge at the vaginal orifice, and a small stream of urine will often escape alongside the instrument. I believe that it is this sagging of the neck of the bladder with its surrounding sphincter away from its normal attachment, rather than damage to the sphincter itself, which is the cause of the incontinence. The sphincter has lost its *point d'appui*, and so fails to act efficiently." With this explanation Bonney is in agreement.

The reason for this sagging of the lower end of the anterior vaginal wall and of the neck of the bladder is that there is a weakening of the musculo-fascial sheet which normally supports the base and neck of the bladder. The anatomy of this fascia has been very fully described by Bonney in the paper already quoted. Blair Bell in the discussion of my preliminary communication objected to the term "fascia" being applied to this sheet, because, as he pointed out, and as I have since verified by examination of a piece of the tissue, it consists to a large extent of non-striped muscle. But when dissected out in the way I am about to describe it has all the characteristics, including extreme strength, which we associate with fascial structure. I can therefore see no reason why we should not call it fascia. It is not easy to demonstrate in the dissecting room, but in the operating theatre it can be demonstrated with the greatest ease as a strong musculo-fascial sheet passing from the back of the pubes to the lateral aspects of the cervix, intervening between the bladder and the anterior vaginal wall, and attached to both, but more firmly to the latter. It is continued backwards alongside the cervix to become continuous with the rectal fascia. The pubo-vesico-cervical part of it is the chief support of

the bladder, and any weakening of it will result in cystocele, just as weakening of its posterior part will, in the absence also of levator support, result in rectocele. If the levator ani muscles and their fascia are damaged no rectocele follows, provided the rectal fascia remains intact, as it very frequently does. It sometimes happens that the pubo-vesico-cervical fascia is weakened only in that part which supports the neck of the bladder. No cystocele, in the ordinary sense of the word, results from this, but the neck of the bladder is permitted to sag away from its normal situation and attachment to the back of the pubes. In such cases there is incontinence of urine under strain although no cystocele is present. In other cases the fascia retains its tension in the region of the neck, but is weakened over the rest of the bladder, so that we meet with cases of cystocele with perfect urinary control.

Before taking up the operative treatment a note may be interposed regarding what I believe to be the causes of the condition and its prophylaxis. When the head comes down on the pelvic floor the posterior segment of the latter resists, driving the head forward against the anterior vaginal wall. The more resistant the perineum, the more strain is thrown on the anterior segment and on the fascial support of the bladder. An overstretching or tearing occurs from which recovery may not take place, and a permanent relaxation results. This strain is further aggravated by the attempts of the obstetrician to "save the perineum" by restraining the sinciput and pushing the whole head forward before the occiput has come right underneath the pubic arch. I believe that in this way the perineum may be "saved," but it is frequently at the expense of a damaged bladder fascia, which will be evidenced later by a cystocele. For that reason I never hesitate, in cases where the pelvic floor is unduly resistant, to perform an episiotomy. This I also do as a routine in all cases of breech delivery in primiparae, as not only does it save the anterior pelvic supports but facilitates in the most marked way the delivery of the after-coming head. Another causative factor is the pushing down of the anterior lip of the cervix by the head of the child. This is most often seen in multiparae, but may occur in a primipara. If it occurs the fascia is, as it were, stripped off the bladder. Whenever it is noticed the cervix should be pushed up over the head during the pains. If these two factors are kept in mind, and the above-mentioned simple treatment carried out, there will be fewer cases of cystocele and loss of bladder control.

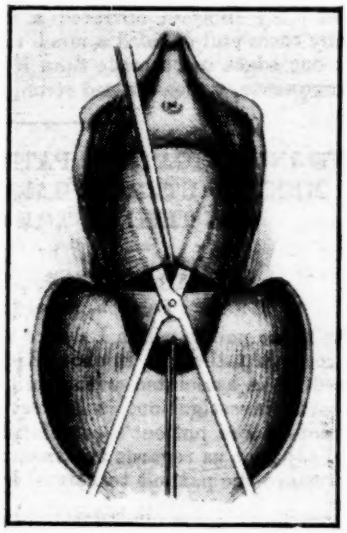

FIG. 1.—Cervix pulled down. Transverse incision at junction of cervix and vagina. Blunt scissors dissection of anterior vaginal wall from bladder.

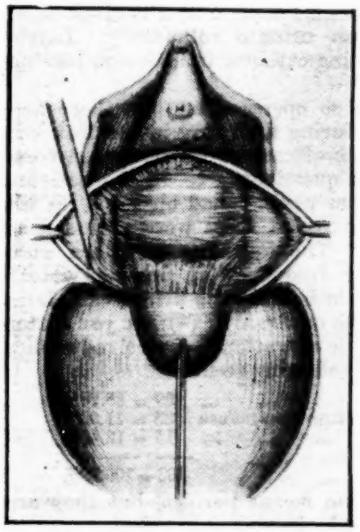

FIG. 2.—Anterior vaginal wall incised up middle line. Fascia dissected from under surface with handle of knife.

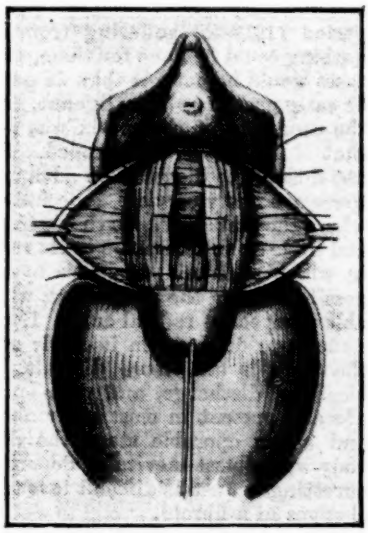

FIG. 3.—Fascia separated. Bladder pushed up. Overlapping sutures of catgut in fascia inserted. Note the deep grip of the upper suture. A second similar one is inserted, but not shown.

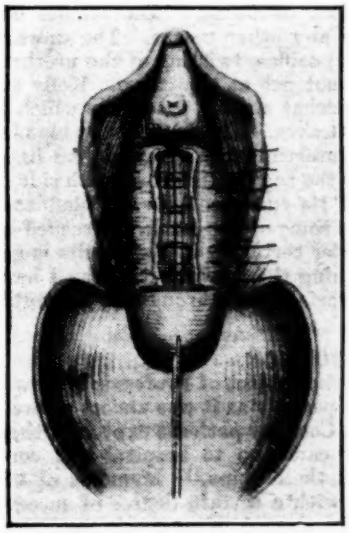

FIG. 4.—Fascial sutures tied. Excess of vaginal walls cut away and mattress sutures inserted.

Believing, as I do, that the cause of the lack of control is to be found in the relaxation of the fascia supporting the neck of the bladder and not in damage to the sphincter itself, my treatment has consisted in restoring the tension of the fascia in the region of the neck of the bladder so that the latter is braced up to its normal position behind the pubes.

In operating on cases of cystocele I always dissect out the pubo-cervical layer of the pelvic fascia. It is a very strong musculo-fascial sheet, and can be easily traced in its continuity from pubes to cervix. I have found that the easiest way to demonstrate it is to make first a transverse incision at the junction of cervix with anterior vaginal wall; then blunt-pointed scissors are pushed upwards for a short distance between the vaginal wall and bladder in the middle line towards the urethra (Fig. 1). The scissors are opened out, withdrawn, and the vaginal wall incised for a short distance along the line of separation so effected. This is the method of incision described by Eden and Lockyer. The scissors are again introduced, and now the points are kept closer to the under aspect of the vaginal wall. If this is done the scissors will pass between the fascia and the vaginal wall, so that when the latter is divided the fascia will be plainly seen. This mid-line incision is continued to within 1 cm. of the urethral orifice. Each edge of the incision in the anterior vaginal wall is grasped with forceps, and with the handle of the knife the fascia is completely separated from the under aspects of the two flaps (Fig. 2). The bladder is pushed up from the supravaginal portion of the cervix, and the fascia is united over it by sutures which grasp it firmly and which cause it to overlap (Fig. 3). In the region of the neck of the bladder a firm bite of the fascia is taken with the needle well up towards the pubis, a similar bite on the opposite side, and the suture tied. Two sutures placed in this way tuck the neck of the bladder up under the pubis, and, if a sound be now introduced into the bladder, it can no longer be made to sag away from this situation. In the region of the cervix the sutures which unite the fascia pass through the front of the supravaginal portion (the bladder being held up while the needle is passed), and so the bladder is prevented from slipping down on the cervix again. The redundant vaginal wall is cut away and the edges united with

mattress sutures and a superficial continuous one (Fig. 4). Repair of the posterior pelvic floor is then performed.

So far as the incontinence of urine is concerned, the important sutures are those which overlap the fascia at the neck of the bladder and so restore it to its normal position. If these are not properly inserted the incontinence may persist in spite of the cystocele being cured. If cystocele is not present it is not necessary to incise the whole length of the anterior vaginal wall. The incision may be made in the mid-line over the neck of the bladder, and the fascia isolated and tightened by sutures.

After such operations the patient almost invariably requires catheterization for some days, and it is often eight or ten days before she can urinate voluntarily. Lately I have inserted a self-retaining catheter in all cases, leaving it in for four or five days.

In none of the patients so operated on was there any return of the incontinence during their stay in hospital, but we cannot possibly judge the efficacy of the operation from that. I accordingly sent a questionary to all the patients with urinary incontinence on whom I had operated up till six months ago. The more recent cases were excluded as not affording a fair test. The following questions were asked: (1) Have you any frequency of passing water? (2) Have you any difficulty in holding the urine? (3) Does it come away when you cough or strain? (4) Are you better in this respect than before the operation? I received replies from 105 patients, with the following result:

Perfect control	69	= 65.70%
Control not perfect but better than before	23	= 21.90%
No improvement	13	= 12.40%
	105	= 100.00%

The results are thus by no means perfect, but they are encouraging, and I feel can be improved by greater care in inserting the upper two sutures of which I have spoken. The self-retaining catheter, I think, is also likely to do less immediate damage to the repaired structures than frequent catheterization, besides taking all strain off the sutures by preventing any accumulation of urine. The results are better than I have got by any other means. The upward displacement of the urethral orifice, twisting of the urethra, and similar operations do not get at the cause. Kelly six years ago advocated a somewhat similar procedure which is described and modified by Graves. The neck of the bladder is exposed and "several interrupted sutures of fine linen are then passed, picking up the ragged tissues on each side of the urethra at the level of its entrance into the bladder." Doubtless in that operation some of the fascia is grasped by the sutures, but much greater certainty in the results is got by freely exposing and defining the fascia in the way I have described. The suture material I use throughout is catgut.

DISCUSSION.

The PRESIDENT regarded the subject of Professor Watson's paper as most important, especially as it was almost entirely neglected in the books. His Cockney patients expressed their trouble vividly when they came up to hospital and complained that they "jerked their urine." Members of the Section had all, no doubt, with a certain degree of success, but in a haphazard way, attempted to cure this condition, but Professor Watson had shown them how the pubo-cervical musculo-tendinous layer could be isolated and securely sutured.

Mr. MILES H. PHILLIPS (Sheffield) could endorse all Professor Watson's statements. The results of operative treatment on the lines laid down were extremely satisfactory, but there would always be a number of failures in those few patients in whom the fibro-muscular tissue had "perished" and would not hold sutures. He agreed with the statement that want of full control was frequently associated with ordinary vaginal prolapse, although the patient did not always mention the fact unless confronted with the routine question, "Have you any difficulty in passing or holding water?" As regards prophylaxis, episiotomy was probably of value.

Dr. R. W. JOHNSTONE (Edinburgh) said that he had several times watched Professor Watson doing the operation which he described and had himself practised it. It was a much easier thing than the description would perhaps lead one to think to isolate the pubo-cervical fascial layer which Professor Watson had described. Like most gynaecologists, the speaker had usually been content to tighten up the neck of the bladder by means of a purse-string suture, but he was inclined to think that the technique which had been described was more anatomically correct and ought to lead to more uniform success in the treatment of the imperfect urinary control. He entirely agreed with the writer of the paper as to the prophylactic value of episiotomy, particularly in primiparous breech cases in whom the perineum would otherwise always be torn. An episiotomy incision obviated a great deal of difficulty in many cases and enabled a much more accurate coaptation of the cut edges to be made than in a ragged tear, with, as a consequence, a cleaner and stronger healing.

THE INVESTIGATION, PATHOLOGY, AND TREATMENT OF UTERINE HAEMORRHAGE ABOUT THE TIME OF THE CLIMACTERIC.

BY

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THE three points which I desire to emphasize are: (1) that as regards pathology, in about 25 per cent. of cases abnormal bleeding is associated with malignant disease; (2) that as regards investigation, it is very desirable that the whole extent of the patient's complaints should be investigated; and (3) that as regards treatment, the endeavour should be to restore the patient to normal health and comfort.

Pathology.

I have analysed a series of 292 consecutive cases of women at or after the 40th year whom I have had in home or hospital on account of uterine haemorrhage, and I find that 61 of these were suffering from malignant disease. If to these had been added the cases I had seen during the same period (1919-23) suffering from cancer so advanced that nothing could be done for them, the proportion of malignant cases would be not less than 25 per cent. In addition to the 61 cases proved to be malignant, there were 50 cases in which the condition of the cervix was such as to make me advise that it should be microscoped. For, of course, while it is not difficult to diagnose an advanced case of cervical cancer, there are many cervices, especially in early adenocarcinoma, where the masses of growth are in the substance of the cervix and little or no ulceration of its vaginal surface has occurred, in which a certain diagnosis by sight and touch is hardly possible during the early stage, when alone there is a reasonable prospect of radical cure. If cancer of the cervix can be difficult to diagnose in its early stage, malignant disease of the body is still more difficult. The trio of symptoms—bleeding, discharge, and pain—produced by uterine cancer are also present in most other abnormal uterine conditions, and at an operable stage the diagnosis of cancer of the body will almost inevitably depend upon the examination of curettings. Just as difficult it is to diagnose early malignant changes in a fibroid.

It is worthy of note how frequently myomata, which presumably have been present for a decade or more without giving rise to any symptoms of moment, will set up serious trouble about the period of the menopause. This may be the result of—(1) change of position, (2) degeneration, or (3) malignant changes.

1. *Change of position.*—For example—

Mrs. G., aged 47, had had nine children, the youngest 7 years old. Menses quite normal until the age of 44, then menorrhagia commenced. A fibroid was diagnosed, but an operation was declined until to the bleeding was added severe bearing-down pains. A tumour was found protruding through the well dilated cervix and was removed per vaginam. It was a fibroid and weighed 1½ lb.

This patient recovered, but in two out of five cases of partially extruded fibroids sloughing and sepsis resulted in the death of the patient.

2. *Degeneration.*—The various non-malignant degenerative changes—cystic, necrobiotic, etc.—are associated with reduced blood supply which makes the tumour more liable to infection, with consequent fever and pain.

3. *Malignant Changes.*—Degenerative changes, both simple and malignant, are very likely to take place without giving rise to definite symptoms. Out of 94 hysterectomies for fibroids, malignant changes were found by the pathologist in five cases. In two of these the growth had invaded the bowel, necessitating enterectomy, and the bowel symptoms were the prominent ones. In two others the appearance of the tumour on section was the first indication that the growth was probably malignant. In one case only was a provisional diagnosis of probable malignancy made on account of pain and rapid increase in size.

In a sentence, then, malignant disease was present in 25 per cent. of cases of abnormal bleeding about the climacteric, and while still in an operable condition its diagnosis is frequently very difficult and often impossible without some operative procedure such as curettage.

Investigation.

This should be begun by an endeavour to obtain a clear account of the patient's symptoms and the extent of her disability; in fact, an attempt should be made to arrive at an approximate diagnosis before beginning the physical examination of the patient. My first two questions are—(1) How long have you been ill? and (2) What was the first thing you noticed wrong? Then the patient is encouraged to give a consecutive account of her illness, irrelevancies being cut out as tactfully as possible and leading questions avoided.

It will be found in most cases that the bleeding is not the only symptom; commonly discomfort or pain also exists, the character and extent of which must be known if we are to be in a position to "cure" the patient. It is only in a minority of the cases that stopping the bleeding will alone suffice to make the patient a healthy, comfortable woman.

I do not think any useful purpose would be served by discussing at length the details of a diagnostic bimanual examination. In all cases where the diagnosis is doubtful I wish to plead that instead of adopting the policy of "wait and see," the danger of incipient cancer should be explained to the patient, and some surgical procedure advised: either a diagnostic curettage, or the excision of the uterus, or of some part of it.

Treatment.

The conclusion to which I have rather reluctantly been driven after twenty-four years' experience—the first ten years as a general practitioner, the remainder as an operating surgeon—is that hysterectomy is the safest treatment for a majority of the cases of menopause haemorrhage, and also the one most likely to restore the patient to comfort and health.

I have indicated the difficulties in diagnosing cancer in its early stages, and could quote case after case in which the most experienced observers have been in doubt. At the very last meeting of the North of England Gynaecological Society, Mr. Miles Phillips showed a specimen of adenocarcinoma of the cervix where the diagnosis was uncertain before the excised uterus had been examined microscopically. Last year I saw a woman dying of a cervical cancer invading the vagina and involving bowel and bladder, who had been examined eighteen months previously by a well known gynaecologist and had been assured that she had then no sign of cancer.

In 1914 Dr. Eurich began a systematic examination for me of my hysterectomy specimens—an investigation which was interrupted by the war—and in two of these he found tiny nodules of cancer in the wall of the body of the uterus visible to the naked eye, but which, had a diagnostic curettage been done, were so small that they might have escaped the curette or been too much broken up by it to permit a microscopic diagnosis to be made. This is what appears to have happened in one of my cases.

Mrs. T., aged 56, had hysterectomy performed and cancer of the body was found. Two years before curettage had been done by another surgeon and the curettings were reported to be innocent.

My first reason, then, for suggesting radical treatment in cases of menopause bleeding is that many of them are potential cancer cases, and that removal of a useless and unhealthy organ will relieve the patient from the menace of a painful illness and a miserable death.

There is a further reason for advising hysterectomy in a large proportion of these patients, which is that they are suffering from symptoms which nothing short of radical treatment is likely to cure. Function and not anatomy is the important consideration. The question to be decided is what is the least extensive and risky procedure likely to make the patient as functionally normal as possible. The operation required may be as simple as a curettage or the removal of a cervical polyp. An eroded or split cervix may be cauterized (in my experience much more effective than curette and caustic) or excised, and where prolapse is present a colpo-perineorrhaphy may be done.

Yet, as will be seen from the table of cases, I have performed hysterectomy in 201 of my 292 patients. In a considerable proportion of these there was no reason to suspect cancer, and the radical operation was suggested to the patient because it was thought that a less complete operation was not likely to "cure" her. Frequently there was old tubo-ovarian disease, or a more or less disabling degree of pain was associated with the dragging of a heavy and often tender uterus. For example—

Mrs. G., aged 42, the widow of a civil servant, had, since his death, attempted to keep herself and her two children by taking in boarders. She suffered from menorrhagia, backache, and bearing-down pains, which by tea-time each day almost incapacitated her. She consulted a physician, who referred her to me: I removed a heavy uterus of the so-called metritic type. Within four months of the operation she was able to take a post as matron of a house at a boys' preparatory school, and reported herself as being better than she had been for years and quite free from the old backache and pain.

In cases such as this the menorrhagia is only part, and perhaps a minor part, of the disability; treatment, such as by radium, which may control the bleeding, will not thereby make the patient a useful, happy member of society. We have no radium available at Bradford Royal Infirmary. Had we had a radium department I think perhaps at most twenty-five of my cases (those where bleeding was the essential symptom) might have got quite well without radical operation, but in the others there was either cancer (actual or potential) or a condition other than the bleeding sufficient to produce some degree of invalidity.

Three years ago I operated on a lady who suffered from prolapse and menorrhagia, doing a perineorrhaphy and excising a considerable wedge from a heavy metritic uterus. The prolapse is cured and the menses are no longer excessive; but the patient, who is well over 50 years of age, still has considerable malaise with each period, and is something of an invalid for two or three days each month. Had I performed hysterectomy three years ago I think she would long ago have become an entirely healthy woman.

Dr. Fletcher Shaw, after quoting Henry Bennett's description of the women "suffering from chronic uterine inflammatory disease . . . most of whom would, if their disease were only discovered and cured . . . eventually recover their health, spirits, and powers of locomotion," writes: "A very large proportion of them give a long history of symptoms, generally dating from a pregnancy, but it is often only after years of medical treatment, and when nearing the menopause, that these symptoms become so severe as to necessitate an operation." Such a patient is likely to wish beyond all else that what is done shall, if possible, be final; the notion that women have a strong inherent sentimental objection to losing the womb has not been borne out in my experience. Given the choice of a minor operation which possibly may relieve her and a hysterectomy which is very likely to cure her and will certainly rid her of an unhealthy, useless, pain-producing organ, the almost invariable reply I get is: "I want to be made well, and please don't leave anything which isn't healthy behind."

All of us who specialize tend to become obsessed by our specialism and to lose perspective. Fortunately for our patients, perhaps, it is the general practitioner whose advice is sought and who decides which specialist shall be asked to deal with the case. The general practitioner will try a new method of treatment for a time, but will only continue to advocate it if the results are good; he has opportunities to note its success or failure over long periods which do not fall to the lot of the specialist. It was my own experience in general practice which disappointed me with the results of partial operations in cases of menopause bleeding. I am

encouraged to continue hysterectomy by the fact that the family doctors—including some who refer work of other kinds to other surgeons—continue to send patients to me for hysterectomy, not infrequently expressing in their letters the hope that I will "make a clean sweep."

ANALYSIS OF 292 CONSECUTIVE CASES.

Fibroids: 102.
- Curettage 1.
- Removal per vaginam of partially extruded fibroids 5 (2 died).
- Removal per vaginam of malignant fibroid 1 (died).
- Hysterectomy 94 (of these 5 were malignant and 6 were reported to be "degenerating") (1 died).
- Exploratory laparotomy (malignant—inoperable) 1.

Degenerative changes in uterus (for example, chronic metritis, fibrosis, glandular endometritis) : 57.
- Removal of adnexa only (ovario-salpingitis) 4.
- Hysterectomy 53 (2 deaths) (2 cases were associated with adherent ovarian dermoid; 4 with cystic disease of the cervix; 21 with chronic adnexal disease).

Cervix suggesting commencing cancer: 50.
- Local excision 4.
- Local excision with colpo-perineorrhaphy 16.
- Hysterectomy with colpo-perineorrhaphy 3.
- Hysterectomy (where suspicious cervix was associated with some other pathological condition—for example, pyometra, adnexal disease, tender and painful fundus) 27 (1 died).

Cancer of body (hysterectomy) : 5.

Cancer of cervix: 49.
- Hysterectomy 13 (2 died).
- Local treatment of inoperable growth 34.
- Referred to radiotherapeutist 2.

Polypi presenting at os uteri: 21.
- Local excision 15.
- Hysterectomy 6.

Subinvolution, endometritis, etc. (curettage) : 5.

Declined operation: 3.

DISCUSSION.

Dr. J. J. BELL (Bradford) acknowledged that what Mr. Phillips had said was based upon the results of his own personal experience. He himself, in the course of his work, had found that many of these cases could be cured without the necessity of a severe major operation. The profound exhaustion of many of these patients after prolonged bleeding could be markedly improved by rest in bed. He confined his remarks to those cases of menorrhagia and metrorrhagia which presented no obvious gross lesions requiring drastic treatment. They had a small amount of radium at the Samaritan Hospital, and ten to twelve hours' application of radium would completely cure all cases of excessive haemorrhage which presented no gross pathological growth. He felt certain that conservation of the uterus was a comfort to the patient. Radium would completely cure bleeding in cases of uterine fibrosis where repeated curettings would not. He had known of complete recovery with radium treatment in cases where recurrence in the vaginal vault had followed panhysterectomy for cancer.

Dr. J. J. HOLLAND (Western Australia) referred to the alarming increase in the incidence of cancer in Australia, and stated that a recent conference of experts in Melbourne had condemned radium treatment outright. Patients had been known to clear up after exposure to radium, and then to come back in a few months' time in a worse condition than before. He would like to ask how long expectant treatment ought to be followed. A very small growth in the cervix might have extensive intraperitoneal deposits which could only be discovered by opening the abdomen. Curetting was probably useless. He strongly condemned delay in the radical treatment of unnatural haemorrhages and advocated complete hysterectomy, as it could do no harm and made the patient much more comfortable.

Professor B. P. WATSON had difficulty in arguing for or against hysterectomy in cases of climacteric haemorrhage, because treatment must be based on accurate diagnosis. Such a diagnosis should be obtainable with the patient under an anaesthetic, when, on careful bimanual examination, it ought to be possible to determine the size, shape, and consistency of the uterus, and any abnormality in the appendages. If, on such an examination, the uterus was found to be of normal size or only slightly enlarged, the appendages normal, and the results of the curetting negative for malignant disease, radium should offer the best and safest line of treatment. On the other hand, if there was a badly lacerated, hypertrophied, and catarrhal cervix, if the uterus was very heavy, metritic, and displaced backwards and downwards, or if there was disease of the appendages, the patient's symptoms might not be relieved by mere stopping of menstruation. In such cases he would certainly advocate hysterectomy, and did so constantly in cases of marked prolapse with a uterus as described. If vaginal hysterectomy was performed and the operation completed according to the Mayo technique, an extensive pelvic floor repair being done, the results were, in his experience, much better than those obtained by any other means.

Mr. MILES H. PHILLIPS also stressed the absolute importance of diagnosis as the only sound guide to treatment. Cases of simple "chronic metritis," or chronic subinvolution, could be certainly cured with radium if used in sufficient quantity (2,000 milligram-hours). Apart from these cases his bias was, with Mr. James Phillips, strongly in favour of total hysterectomy, especially when the cervix was lacerated or chronically inflamed. If there was vaginal prolapse this could be cured at the same time by the modern plastic operation after removing the uterus by the vaginal route.

Mr. GORDON LUKER agreed with the previous speaker as to the importance of accurate diagnosis of the cause of the bleeding before deciding on the treatment suitable to the case. He was satisfied that curettage, if properly carried out, could be relied upon to produce evidence of malignant disease where such existed. He always used a tent before curettage, if possible, in order that the cervix might be dilated sufficiently to allow digital exploration and a thorough scraping of the uterine cavity. If carcinoma of the body and cervix was excluded, he placed his cases for treatment in three classes—mild, moderate, and severe. If the bleeding were only mild he found that some were cured by curettage followed by the administration of pituitary extract and calcium lactate. In cases of moderate severity he found radium almost a specific, using 100 mg. for twenty-four hours. In severe cases where much anaemia was present he thought that hysterectomy was the best treatment. This was also indicated when the uterus was much enlarged by chronic metritis or by one or more small fibroid tumours, when severe chronic cervicitis was present, or when there was coexisting disease of the adnexa. He was doubtful whether it was necessary to remove all the pelvic organs in young women suffering from adenomyoma of the uterus or one ovary. He was not familiar with cases of recurrence of the condition after the primary focus had been removed. Seeing that the disease was not malignant he had up to the present made a practice of conservative methods when operating.

Mr. W. W. KING (Sheffield) thought that cases of menorrhagia without gross pathological changes could be readily cured by radium, although he had experienced a few failures, bleeding returning after the first application. In cases of metrorrhagia—excluding such simple pathological changes as polypi—it was far better to remove the uterus rather than to delay, waiting for a pathological report. It was a matter of very great difficulty to determine malignant changes in curettings, and, knowing this, the pathologist would always tend to err on the side of safety. When the report had been received the patient might refuse a second operation, and the fallacious impression was left that curetting could cure cancer.

The PRESIDENT thought that the "investigation" part of Mr. Phillips's paper was the part which had been least emphasized in the discussion. Undoubtedly the first thing to do in all these cases was to examine them very thoroughly, whenever possible inserting the gloved finger inside the uterine cavity. He agreed that it was difficult to be certain whether cancer was present or not in curettings. He would like to utter a word of warning against the use of terms like "precancerous" or "potential cancer"; they were bringing trouble upon themselves

in using them. There was no doubt that radium had done an enormous lot to cure cases where nothing obviously surgical had been discovered, but he thought they were still rather vague about the question of dosage. He used 100 mg. exposure for twenty-four hours, or 50 mg. exposure for forty-eight hours, in cases of cancer. Radium employed before operation enormously diminished the chances of implantation recurrence taking place.

THE ADVISABILITY OF A ROUTINE PELVIC EXAMINATION DURING THE PUERPERIUM.

BY

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ANTE-NATAL examination is nowadays, and quite rightly, attracting much attention; this is in accordance with the modern desire to promote preventive medicine. With the same object in view it is very desirable that a thorough pelvic examination of the mother should be made during the puerperium—before she is permitted to return to ordinary life. In this way many of the diseases which occupy the gynaecologist's attention, and which result from the wear and tear of parturition, may be caught in their earliest stages, when they are so much more amenable to treatment.

Twenty years ago I commenced to make a routine examination on the twelfth day of the women who had been confined in the Jessop Hospital, Sheffield; ever since then I have paid special attention to this examination and have become more and more impressed with its value. During the same period, in both consulting and hospital practice, I have met with a very large number of patients who would have greatly benefited had such an examination been made.

On inquiry I have found that very few family practitioners make such an examination. They generally say that they were not taught to do so. Some think the patients might resent it; there, I believe, they are wrong. The practice appeals to women as a very sensible one, and I have never known a patient demur. On the other hand, I have often found it difficult to explain away the fact that an examination had not been made before. Well trained nurses nowadays also realize its value, and prepare the patient's mind by pointing out the advantages of knowing whether or not everything is all right.

The best time to make the examination is, I think, about the twelfth or thirteenth day; this is a day or two before the hospital patient goes home, or just before most of us allow our private patients to walk about the bedroom. Should anything abnormal be found demanding more rest and care the patient is thus saved the disappointment of being ordered back to bed. Originally I was more or less compelled to choose this time by the exigencies of hospital practice. Later I realized that the state of the lochia, the size of the uterus, and condition of the cervical canal render it the most suitable time.

The examination should be a thorough one of inspection and palpation—not simply a perfunctory search for the presence or absence of retroversion of the uterus, which is by no means the most frequent or important departure from the normal. The bladder and lower bowel having been emptied, the patient is carefully placed in a correct Sims's posture with the buttocks opposite a good light. The doctor's hands and the patient's vulva are prepared as if for an examination during labour. The perineum and vulva are first inspected. Then a Sims's speculum of suitable size is chosen and inserted, and the nature of any discharge and condition of the vaginal walls and of the cervix is investigated. As will be seen later, certain abnormal states will require treatment which can be carried out at once. The speculum is now removed and digital palpation of the vagina, pelvic floor, and cervix is made; the patency of the cervical canal is also ascertained. Normally by the twelfth day the internal os will not admit the forefinger; occasionally it will do so, and then with the assistance of the left hand on the lower abdomen it is possible to explore the cavity of the uterus. Finally the position and size of the uterine body can be ascertained by bimanual examination, and inflammatory or other extrauterine swellings sought for.

Amongst the most common lesions to be discovered are incompletely healed lacerations. It is obviously a simple duty to inspect a repaired perineum or vaginal outlet to see if it has completely healed. Tears may, however, also occur, and even in unassisted labours, in the upper vagina: often these are not immediately found and sutured. They heal by second intention, not seldom with the formation of granulation tissue, which may proliferate to form granulation polypi of considerable size. These, when found, can be painlessly snipped down with scissors and destroyed with pure carbolic acid. If neglected they may produce a discharge for which I have known patients to be fruitlessly douched for many weeks. Such granulations are, however, more commonly seen in the angles of a lacerated cervix; here they may be sessile or polypoidal. They cause discharge and readily bleed; they may persist for years, but are readily and painlessly cured with a pair of curved scissors and a strong caustic—the earlier the better. If neglected they help to form the chronically inflamed ectropion of the cervix, which is the result of an infected cervical laceration. This is a very common and troublesome disease, generally not seen by the gynaecologist until many months have elapsed. The cervix may then be beyond recovery and have to be amputated more or less completely. In the puerperium the condition may be cured by the simple measures I have already indicated. In this connexion I must refer to those tragic cases of rapidly growing carcinoma of the cervix occurring soon after parturition. I have seen them advanced and inoperable within so few months of the last labour that there seemed to be no doubt that the disease must have been present and recognizable during the puerperium. Unfortunately, the bleeding and discharge produced by the growth had been thought to be of no special importance so soon after labour.

Delayed involution of the vaginal walls and pelvic floor will be recognized easily by one who, accustomed to these examinations, is aware of the variations in the rate of involution of these structures. It is the only way in which he can obtain a normal standard by which to judge. Suitable treatment in these early days will lessen the incidence of vaginal prolapse. The degree of involution of the uterus is estimated on bimanual examination and is conveniently standardized by comparison with the size of the pregnant organ. On the twelfth to fourteenth day it is usually slightly larger than the uterus at two months. In a number of cases where the uterus is larger than it should be one will find the cervical canal patulous, the internal os easily admitting the forefinger. The cavity of the uterus can at once be explored, the left hand being used to press the fundus and body of the uterus downwards towards the exploring finger. In this way the uterus has occasionally been found to contain one or more rounded nodules lightly adherent to the lining membrane. These it is usually easy to separate with the finger, and occasionally one can hook the piece with the finger through the cervical canal. Usually, however, it is necessary and better to wash or scoop them out by means of a large flushing scoop and a stream of hot lotion. For this the patient should preferably be put in the lithotomy position. Very rarely is any more than slight bleeding so caused. It is only in the case of a very nervous woman that anaesthesia is required at this stage of the puerperium, whereas later on an anaesthetic is necessitated by the need for instrumental dilatation of the cervix. Microscopical examination of these nodules has usually shown decidual tissue only, surmounted by organizing blood clot; they might be described as "decidual" rather than "placental polypi." In any case they are to be distinguished from masses of retained placenta which usually cause serious haemorrhage and other symptoms at an earlier date.

Lochiometra and Endometritis.—In some cases lochia will be found to be pent up in the uterus; it is then usual for the organ to be unduly anteflexed, though it may be retroverted. In either case it should be straightened by suitable pressure with the fingers; this will result in a gush of fluid from the uterus—either turbid serum or muco-pus—an indication that drainage from the uterus is defective. The uterine cavity should in these cases be irrigated with a suitable antiseptic solution, and this may have to be repeated on more than one occasion; sometimes

it is an advantage to introduce a drainage tube, or the cavity may be swabbed out with suitable antiseptics. Such retained lochia may be found to contain pathogenic organisms, and I suspect that this is an early stage in the development of that form of chronic metritis which leads to chronic subinvolution—a far too common gynaecological disease. A rise of temperature, often only slight and not above 99° F., not infrequently accompanies this condition of lochiametra. In not a few of these cases the offending organism is the gonococcus, which is prone to spread from the cervix to the uterine cavity after parturition. Prompt and thorough treatment at this stage should prevent the onset of salpingitis and pelvic peritonitis, as well as of chronic metritis.

Retroversion.—Retroversion of the uterus will be found in a small percentage of these women at this stage; the uterus should be fully replaced and held so by a pessary—preferably a broad Hodge. In primiparae there is a considerable chance of permanently curing the displacement in the course of the following three or four months, during which involution of the uterine supports appears to continue. As involution of the vagina progresses it is usually necessary to lessen the size of the pessary once or twice before the test of leaving it out is made. Retroversion may, however, not occur until the third or fourth week—I have never known it do so later—and knowledge of this has led me to make a second examination of my private patients towards the end of the fourth week; some day I hope this will also be practicable for hospital patients. These statements about retroversion will be of interest only to those who recognize that retroversion may cause much pelvic discomfort, and in some patients is a cause of sterility, in others of repeated abortions. Having convinced myself that this is so, I strongly advocate making the attempt to cure the condition by simple pessary treatment.

Such are my chief reasons for advising a routine examination during the puerperium. One other has been omitted which is not the least important—the satisfaction of those fortunate patients to whom one is able to announce that "everything is all right."

DISCUSSION.

Dr. McGREGOR YOUNG (Leeds) stated that a routine examination was made of all patients at the Leeds Maternity Hospital at the time of their discharge from the hospital, usually from the twelfth to fourteenth day after delivery. Notes were taken as to malposition of the uterus, and of 1,000 consecutive cases retroversion was found in 50 cases—that is, 5 per cent. Previously it had been the practice where such malposition was found to insert a pessary, but it was determined to try what the result was without any support. In this 1,000 cases nothing was done, and the patients were discharged without remark—that is, no suggestion was made to the patient that anything abnormal had been found. Most of these women attended at intervals later. At the end of six months these 50 cases were asked to attend, and 32 came for re-examination. Of these 32 retroversions 30 were found to be normal and anteverted—that is, 93.7 per cent.; only 2 remained retroverted—one from a cause not apparent, the other in consequence of several fibroids in the posterior wall of the uterus.

The above observations were made prior to January 1st, 1924, and reported to an obstetrical society. Since that time similar notes had been taken in 748 cases more. Among these, 42 cases of retroversion were found—that is, 5.6 per cent. Only 14 of these had completed a six months' interval from delivery, and of these 14 only 8 responded for re-examination; 7 were found normal and one persisted in the retroverted position. This latter was a 12-para, and had probably suffered from retroversion before her pregnancy.

A careful search was made for the possible causes of the retroversions in these 1,748 cases, especially for any lesion which might lead to subinvolution, which was considered the probable antecedent to the retroversion, such as sapraemia, pelvic inflammation, pelvic tumours, excessive haemorrhage, prolonged labour, and retained portions of placenta. The results were as follows: of the 92 patients with retroversion, in 60 patients there was a perfectly normal puerperium, 14 showed a mild sapraemia, 4 had placenta praevia with haemorrhage, and 2 had undue haemorrhage. The remainder had prolonged labour or malpresentations, or required manipulative interference.

This report was thought of interest in view of the facts that it was a common routine in most maternity hospitals to insert pessaries for retroversion, and it was the common teaching in most textbooks that such treatment is the correct procedure.

Dr. R. W. JOHNSTONE (Edinburgh) said that the title of Professor Miles Phillips's paper had not led him to expect the description of such an elaborate method of examination as the writer appeared to practise. In the Edinburgh Maternity Hospital their practice was to examine all patients before they were discharged, generally about the tenth or twelfth day, but in private practice he preferred to postpone the examination until about the end of the third week. The routine examination involved merely inspection of the perineum, bimanual examination to detect cervical tears, and the position of the uterus. The speculum was never used unless there was some definite indication for it, and he confessed that he felt considerable doubt about the wisdom of introducing the finger into the uterine cavity as Professor Phillips had described. With regard to retroversion of the uterus, it had been his practice, if he discovered a retroversion at the end of the third week, to leave the condition alone for another three weeks or a month, asking the patient to return at that time. In a large number of the cases the displacement was found to have been spontaneously rectified at the end of six weeks, as had just been described. On the other hand, a retroversion was occasionally found to be present in patients at the end of six weeks which had not been present at the end of three weeks. Rectification and the introduction of a pessary at the end of six weeks still held out good hope of cure, since the impetus to involution had not yet exhausted itself.

Professor B. P. WATSON (Edinburgh) agreed cordially with all that Professor Miles Phillips had said. It had been his practice for a good many years to carry out a routine examination on his puerperal patients on the twelfth day, and again four weeks after delivery. He had frequently found that a uterus in normal position on the twelfth day was retroverted at the end of the fourth week. At whatever time he discovered the retroversion he replaced it and inserted a pessary. In one or two cases he had replaced without inserting the pessary, and found that they remained in good position. He would not have the courage to do this, however, unless he were to have an opportunity of seeing the patient at frequent intervals. As a routine he believed that it was better to replace and put in a pessary in all cases. His examination had not gone so far as that of Professor Phillips in that he had been content with an inspection of the perineum and a careful bimanual examination. Unless there were special indications, such as Professor Phillips had mentioned, he did not make a routine examination with the speculum. He had said elsewhere that, as ante-natal care was preventive midwifery, so post-natal care was preventive gynaecology. Now that the value of ante-natal care was fully recognized he thought that the importance of post-natal care must be impressed upon the profession also.

Miss FRANCES IVENS (Liverpool) supported Professor Phillips in his plea for routine pelvic examination in the puerperium. The out-patient departments were crowded with the results of the untreated traumata of labour. Not only would a retroversion be found in a certain number of cases, but frequently also a laceration of the cervix, even where there had been no instrumental delivery. Latent unrecognized gonorrhoea was also responsible for a certain number of puerperal infections. With a routine post-natal examination this would be discovered before the patient got up, and acute exacerbations might be averted. Miss Ivens did not herself employ such a detailed technique as Professor Miles Phillips advocated.

Professor MILES PHILLIPS, replying, said he did not attach importance to statistics in such matters. It was the

individual patient who wished to be cured of her retroversion, by simple means if possible. It was not known which cases would cure themselves spontaneously. With regard to digital exploration of the puerperal uterus, the special indication was a patulous condition of the internal os on the twelfth day. With proper precautions he had found it free from any danger. He was glad to hear that Miss Ivens agreed with him in starting treatment for gonorrhoeal cervicitis and endometritis at this early stage in the puerperium. He hoped that teachers would find it possible to give practical instruction to medical students in this special form of examination.

THE CLINICAL SYMPTOMS OF PELVIC ADENOMYOMATA.

BY

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SINCE the first detailed account of adenomyoma, which was published by von Recklinghausen in 1893, numerous cases have been recorded. Most important additions to our knowledge of the pathology of these strange neoplasms have been contributed by Cullen, Lockyer, and Sampson, but their clinical aspect has not received so much attention. They are, essentially, tumours composed of glandular tissue which has the histological characteristics of the epithelium lining of the uterine cavity. These glandular elements are surrounded by a varying amount of non-striped muscle which in some cases forms the greater part of the tumour, while in others it is scanty or entirely absent.

When fully developed and unmodified by growth the glands and stroma are not only identical with those of the endometrium, but have the same physiological powers. Theodore Döderlein has recorded a remarkable instance of pregnancy within the cavity of an adenomyoma which chanced to be connected with the uterine cavity by a narrow isthmus. This is a pathological curiosity, but menstruation and a decidual reaction during pregnancy regularly take place within these tumours. The symptoms of pain and vomiting are dependent upon the congestion and tension set up by the effusion of menstrual blood into the endometrical islets, each of which thus becomes a miniature haematometra.

Most fascinating theories have been evolved to account for the presence of functionally active endometrium in such diverse and remote situations as the uterine wall, the ovary, the rectum, and the stomach. These growths may arise from some developmental error, or from a downgrowth of the peritoneum, or, as Sampson has suggested, from the accidental implantation of epithelium from the tubes. The interest of these etiological questions is so intriguing that attention has been focused upon them rather than upon the actual manifestations of the disease; in other words, the problem has been an interesting by-path to the pathologist, but somewhat of a *terra incognita* to the clinician. There are, however, recognizable symptoms upon which a preoperative diagnosis can be made, and within the abdomen the appearances are often very characteristic, though sometimes easily missed if not carefully looked for.

The facts upon which this paper is based have been extracted from a detailed analysis of 122 cases upon which I have operated. One patient had two operations (the first a simple excision and the second a hysterectomy), so that there were in all 123 operations. All the cases have been proved to be adenomyoma by histological examination, with the exception of six of the earlier specimens of advanced growths in the recto-vaginal space, which were so typical that sections were not cut. I may here express my indebtedness to Professor J. S. C. Douglas and his staff in the pathological laboratory for their examination of the large amount of material which I have submitted to them during the years which have been covered by this investigation.

An intelligible classification based on the anatomical position of the tumours has been a matter of some little difficulty owing to the fact that they are often multiple, and that they frequently invade one or more adjacent organs. In order, therefore, to avoid a confusing list of subdivisions, the grouping has been formulated according to what appears to have been the main or primary lesion. Upon this basis the growths and their frequency may be classified as follows:

Recto-vaginal space	52 cases
Peritoneum	26 ,,
Ovary	23 ,,
Uterus	17 ,,
Tube	4 ,,

CLINICAL SYMPTOMS.

There were no apparent symptoms in just over 16 per cent. of the cases, including one (aged 64) who was past the climacteric. The growths in these cases were found at operations undertaken for other conditions.

Age.—Endometrial new growths may be found at any age; the youngest patient of this series was 20 years of age, and the oldest 64. The climacteric may be delayed, but, when it is established, the growths atrophy like the uterus.

Sterility.—Patients who suffer from adenomyoma appear to be specially prone to be sterile. Many patients of this series had never been pregnant, and others had not borne a child for eight to ten years.

Abdominal Pain.—This was the most common complaint, and was recorded as being present in 63 per cent. of the patients who had symptoms. It was generally described as a "shooting," "gripping," or "aching" pain situated in the lower abdomen; but in a few rather misleading cases the pain was entirely confined to the epigastric region. Most, but not all, of the patients complained that it was worse during menstruation, so that this association may form a useful clue in the investigation of abdominal pain of uncertain origin. The onset of the pain was often acute and accompanied by vomiting, and had thus, not uncommonly, simulated appendicitis, renal colic, or gall stones, and operations had been advised or undertaken for these conditions. Generally speaking, however, the pain was described as being more or less continuous, though liable to exacerbations.

Vomiting.—Nausea or vomiting very frequently accompanied menstruation, but 26 per cent. of the patients also complained of these symptoms between the periods. The vomiting appeared to have no relationship to the intake of food.

Dysmenorrhoea.—Dysmenorrhoea is one of the classical symptoms of adenomyoma, and, in these series, it was recorded as being "very severe" in nearly half the cases. On the other hand, 25 per cent. of the patients had either no pain or but slight discomfort during menstruation. The records as to the details of the pain are, unfortunately, rather incomplete, but it was generally of the spasmodic type. Nausea and vomiting were present in 17 out of the 58 patients concerning whom there is positive information (29.3 per cent.)—it is noteworthy that in 8 out of the 17 the growths were in the ovary. Similarly, 15 out of 40 (37.5 per cent.) complained of rectal pain during the period, and of these 15 patients 10 had growths in the recto-vaginal septum. These figures suggest that vomiting is a symptom of ovarian growths and rectal pain of those in the recto-vaginal space, but the figures are not large enough to warrant such a deduction. The most striking feature of the dysmenorrhoea is its sudden onset in a patient who has previously been free from pain. This feature is so characteristic that when present it at once suggests the diagnosis of adenomyoma, and the clinical picture is almost complete if there is rectal pain or vomiting. The absence of these symptoms does not, of course, exclude adenomyoma, for, as has been stated above, quite a considerable proportion have a negligible amount of pain during menstruation.

Menorrhagia.—It is difficult to say to what extent adenomyoma is a cause of menorrhagia. It was present in 52 per cent. of the patients with adenomyoma of the uterus, and, in the absence of any other apparent cause, the haemorrhage may be presumed to be a result of the new growth. Twenty-five per cent. of the patients with extrauterine adenomyoma also had an increased menstrual loss without any gross pathological change to account for it. But in view of the numerous causes of menorrhagia with an apparently normal uterus, these figures do not justify the assumption that there is of necessity any causal relation-

ship between the two. The occasional occurrence of metrorrhagia may be regarded, likewise, as perhaps due to some unknown functional cause.

Dyspareunia.—There is only an actual record of dyspareunia in just over 8 per cent. of the cases, but there can be no doubt that it would have been much more frequently recorded if it had been desirable to make routine inquiries concerning it. The growths in the recto-vaginal space were especially prone to cause this symptom.

Rectal Pain.—Intermenstrual pain in the rectum was complained of by 15 per cent. of the patients, most of whom had growths in the recto-vaginal space. The pain was sometimes shooting or spasmodic and somewhat of the type common in an anal fissure. The pain was more severe during defaecation, and was occasionally only felt during this act. There appeared to be a tendency to increasing constipation in some instances, but in no case was there any actual obstruction.

The Physical Signs.

The physical signs of adenomyoma are only characteristic when the growth is in, or adjacent to, the recto-vaginal space. Adenomyoma of the corpus uteri, if large enough to be palpated, is indistinguishable from a myoma. The physical signs of a tubal growth are equally equivocal. Fixity and extreme tenderness of an ovary will at times help to confirm a diagnosis already suggested by the history, but tumours in more remote positions do not give palpable evidence of their presence. Tumours in the region of the recto-vaginal space, on the other hand, do cause very typical physical signs. In this situation the commonest and most diagnostic sign is a tender retrocervical thickening. A palpable swelling was found in this position in 63 per cent. of the recto-vaginal growths. There may be a localized nodule; but more commonly there is a bar or ridge which can be felt through the posterior fornix traversing the cellular space bounded by the peritoneum, the rectum, and the posterior vaginal wall. Sometimes the ridge is wedge-shaped with the base up, and closely resembles the finger flexed at the first interphalangeal joint. In some cases actual blood cysts may be seen through the mucosa of the posterior vaginal fornix, or, in some rare cases, actual adenomatous polypi, identical with the so-called mucous polypi of the uterus, may project through the fornix into the vagina.

Thickening and tenderness of the utero-sacral ligaments is a most valuable sign, which is best elicited by rectal examination. These ligaments are, of course, often thickened in parametritis, but the sensitiveness to pressure is not so acute, and, in any case, an inflammatory effusion can be readily improved by a course of suitable treatment, but this will not influence an adenomyoma. The only other common cause of induration of the utero-sacral ligaments is a malignant growth of the cervix or rectum. The former can be recognized without difficulty, but the latter may be easily confused with adenomyoma, which quite commonly invades the rectal wall. In this series the rectum was involved to some extent in 24 out of the 52 cases of adenomyoma of the recto-vaginal space (that is, 46 per cent.). The extent of the invasion of the rectum is shown by the fact that its lumen was opened in 11 out of the 24 cases. Sometimes large areas of the anterior rectal wall had to be excised, and in one case so extensive was the growth that three inches of the rectum was removed and an end-to-end anastomosis performed. Rectal examination in a well advanced case discloses a hard, tender, craggy mass in the anterior wall. The physical signs are therefore similar to those of carcinoma of the rectum, with the exception that the rectal mucosa remains intact. Ulceration of the mucous membrane over the growth may occasionally take place, but it was not noted in any of the cases covered by this review.

A tender adherent retroversion was found in 21 per cent. of the cases, so that the presence of this sign warrants a careful consideration of the whole position before operation is undertaken, lest a major operation may have to be performed upon a patient who has not been warned of any such possibility. This unpleasant predicament occurred several times in this series, so that a warning to others may not be out of place.

Morbid Anatomy.

Recto-vaginal Space.—In this situation the growths may vary in size from that of a pea up to large masses which obliterate the pouch of Douglas. They often appear to grow from the back of the supravaginal cervix, and from thence to spread out laterally into the utero-sacral and the broad ligaments, and backwards into the rectum. Very frequently the bowel is characteristically puckered on to the posterior uterine wall, and thereby the uterus is retroverted. The growth in the bowel tends to be situated in the anterior wall, and very often by careful dissection it may be excised without opening the lumen of the bowel, for it does not involve the mucous membrane.

Peritoneum.—In these cases laparotomy disclosed a varying number of black or dark blue cysts occurring singly, or more commonly in groups scattered over the pelvic peritoneum. Individual cysts may vary in size from that of a pin's head up to that of a millet seed; they can often be most easily recognized by palpation, and are very prone to lie on the back of the broad ligament under cover of the ovary. Stellate scar-like areas are also seen, which probably represent adenomyomatous implants which have healed owing to the destruction of their lining epithelium from intracystic pressure. Occasionally clear, firm cysts, with tiny projecting horns, may be noted, and more rarely the peritoneum is thickened so as to present a sort of pig-skin appearance.

Ovary.—Ovarian adenomyomata are most easily recognized when they contain cysts filled with chocolate-like fluid. These may be tiny black cysts on the surface of one or both ovaries; or they may form large "chocolate" cysts which completely fill the pelvis. The ovary may appear to be normal, except that it is adherent to the back of the broad ligament or to the floor of the pelvis, but on separating it the typical chocolate-like fluid escapes. In some cases no macroscopic change may be found, and in these the diagnosis can only be made on histological examination.

Uterus.—Adenomyomata of the uterus closely resemble fibroids, but they are not encapsulated, and are frequently situated near the cornu.

Tube.—Tubal adenomyomata occur as definite localized tumours projecting from the tube, and are generally situated in the region of the isthmus.

Results.

Four out of the total cases died as a result of the operation—a mortality of 3.2 per cent.

In order to obtain a fair conception of the operative results, only those patients have been written to who were operated upon prior to 1924, and from these 103 patients 86 replies have been received. It is only necessary here to give the general conclusions brought to light by the replies. These may be summarized as follows:

1. Hysterectomy with removal of the ovaries cured all but one of the 57 patients who replied.

2. Hysterectomy without removal of the ovaries cured all the 7 patients who replied. But in one instance I have had to remove painful ovaries left after vaginal hysterectomy, which, after removal, were found to contain adenomyomatous blood cysts, so that it is probable that these figures would be modified in a larger series of cases.

3. Excision of the growth without hysterectomy does not give such good results. Only 13 out of the 22 patients who replied recorded a complete cure.

The small localized adenomyomata can be successfully treated by conservative measures, but the more extensive growths require hysterectomy irrespective of the age of the patient.

The Relationship of Adenomyoma to other Conditions.

Inflammation.—In so far as inflammation may have a bearing upon the causes of the disease, it is interesting to note that 39.7 per cent. of the patients had a history with physical signs of some inflammatory process. The causes of the inflammation, as nearly as can be ascertained, were as follows:

Tuberculous	14.9 per cent.
Gonococcal	11.6 ,,
Pelvic abscess or septic confinement ...	13.2 ,,

Myomata.—These tumours were present in 22 per cent. of the cases.

Malignant Growths.—As a contribution to fact and without drawing any conclusions, I may record the following cases in which a malignant growth was associated with adenomyoma:

1. Two patients had carcinoma of the cervix.
2. Three patients had adenocarcinoma of the endometrium.
3. One patient had carcinoma of the sigmoid.
4. One patient is reported to have died of carcinoma of the rectum four years after I had performed a hysterectomy for adenomyoma of the uterus.

DISCUSSION.

Professor B. P. WATSON said he did not think many could have had such an extensive experience of adenomyomata of the pelvis as Dr. King, who had brought out very clearly the important clinical features of those cases. What had struck him most as a symptom in such patients was the development of dysmenorrhoea in a woman who had hitherto had painless menstruation, and in whom very little could be found in the pelvis to account for it; in such circumstances the first thing to be thought of was an endometrioma.

Dr. GORDON LUKER (London) said that his experience had been confined to adenomyomata of the uterus until the previous week, when he had a case involving one ovary in a woman of 30 who had complained of dysmenorrhoea and menorrhagia. He had conserved the healthy ovary as he did not recognize the risk of adenomyoma occurring elsewhere.

Dr. R. W. JOHNSTONE (Edinburgh) said that he had had relatively a very small experience compared with Dr. King, having operated only in a few cases of adenomyoma of the uterus, as well as in a number of cases of so-called chocolate cysts of the ovary. He had doubtless overlooked many cases in which there were tiny puckered scars of the pelvic peritoneum which Dr. King regarded as of pathological importance. He agreed with Professor Watson that the most suggestive symptoms were the onset of dysmenorrhoea in later sexual life, combined with menorrhagia, dyspareunia, and in many cases sterility. He would like to ask Dr. King whether he had any idea as to the likelihood of the tiny peritoneal adenomyomata which he had described undergoing spontaneous cure even in the absence of such radical treatment as he was disposed to recommend.

Dr. KING, in his reply, said that he had intentionally kept off the subject of the pathology of these tumours. In spite of the fascination of Sampson's theory, it would not cover all cases. He thought the typical endometrial stroma was quite a late development, and with not much stroma there would be very little menstruation.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

A MODIFICATION OF THE PEPTONE TREATMENT IN CERTAIN CASES.

FOR some time I have been treating certain resistant cases of asthma, urticaria, etc., with a new peptone method, which is used after the ordinary peptone method has not succeeded.

It is known that in such the blood becomes inspissated by a poison. This blood is now removed and immediately poured into a 10 per cent. solution of Armour's peptone (No. 2), pure and freshly prepared except for the sodium necessary to make it faintly alkaline. It is well shaken up, about 3 to 4 parts blood to 1 part peptone, allowed to coagulate, and is put into an incubator at 37° C. If blood persists with the serum, it is allowed to remain. In five to six hours, if examined, it will be found that a new substance, anaphylatoxin, has been added to the peptone-serum. This entire mass is now carefully removed, and the lot is made sterile with 0.5 per cent. phenol. It is injected into the vein, beginning with 1/2 c.cm. and going up to 2 to 3 c.cm.

London, W.1. A. G. AULD, M.D., D.P.H.

THE PHYSIOLOGY OF DEFAECATION.

DR. STACEY WILSON'S memorandum (August 9th, p. 237) on the curative action that the sphincter ani may exert on piles raises the question of the proper technique of defaecation. This process requires more time than we are disposed to give it. At least two minutes must be allowed for the recovery of the slight prolapse of mucous membrane and the proper closing of the anal door. If we do not hurry, the peristaltic downward action of the last inch of rectum will often expel a small residual motion. If we hurry this is not only retained, but tender mucous membrane gets a polishing that it resents.

If patients are advised to pause, to *inhibit* deliberately the sudden voluntary closure of the sphincter for a minute or two, and to cleanse with lint and cold water, great benefit will accrue. It is surprising how seldom cleansing is really necessary if this is done. I have cured my own piles on these lines, and many patients have done the same.

Castle Cary. DAVID PRICE.

BLOOD GROUPS AMONG SAMOANS.

OF recent years attempts have been made to establish racial affinities by means of characteristic blood groupings. The following observations, unfortunately limited to a small number of persons, are offered as a contribution to this study.

The work was done at the Apia Hospital, Western Samoa, towards the end of 1923, and, after excluding all cases with a known or suspected admixture of European or Chinese blood, there remained 51 cases, presumably pure Samoans, the Samoan being a typical member of the Polynesian race. The first step was to separate the various groups; for this purpose blood was taken from 17 individuals, and the serum from each blood was agglutinated against the cells from the other bloods; also the cells of each blood were agglutinated against the other serums. Samoans and Chinese were included in the 17 individuals, with the result that all the bloods fell into four well marked groups, with one exception, which will be referred to later.

Through the courtesy of Dr. Gilmour, pathologist to the Auckland Hospital, we obtained type serums belonging to Groups 2 and 3 (Moss), and in this way identified our groups. We then tested an additional number of cases, giving us a total of 51 Samoans. The number of cases in each group and the percentages of the total are given in the following table:

Samoans.

Group.	No. of Cases.	Percentage.
1	4	7.9
2	19	37.3
3	7	13.7
4	21	41.1

This may be compared with Moss's original table as quoted by Rendle Short (*New Physiology in Surgical and General Practice*, p. 23):

Group.	Percentage.
1	5
2	40
3	10
4	45

In addition to these Samoan cases we typed the bloods from 12 Chinese coolies, with the following result:

Chinese.

Group.	No. of Cases.	Percentage.
1	1	8.3
2	1	8.3
3	5	41.6
4	5	41.6

The anomalous case already mentioned was a Samoan. The corpuscles from this specimen of blood were not agglutinated by any of the other (16) serums; the serum from this case failed to agglutinate corpuscles from two cases belonging to Group 2, while it agglutinated the corpuscles of cases belonging to Groups 1 and 3. It did not agglutinate corpuscles of Group 4. It would therefore appear to be an anomalous form of Group 4.

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Reviews.

AMERICA IN THE WAR.

Hospitals.

THE fifth volume of the history of *The Medical Department of the United States Army in the World War*[1] contains an account of hospitalization work in home territories. As in some other volumes of the same history to which we have already drawn attention, treatment of the subject is characterized by logical arrangement of the material, a wealth of well documented detail, and an adequate supply of diagrams and other illustrations whenever needed. Only about a quarter, however, of the eight hundred pages of text relate to the subject as a whole, the rest being given up to accounts of individual institutions and their doings. Consequently much of the volume may be regarded as of domestic rather than of general interest. The same is true of the illustrations, those of technical interest, such as detailed ground plans and the like, being relatively few.

The hospital problem as it presented itself to the United States authorities was not quite on all-fours with that facing either Great Britain or France. Though France in principle delimited a war zone of its own, the greater part of the country was in effect and of necessity a military base for all purposes. For hospitalization work Great Britain likewise was a base, since there were frequently times when the hospitals in the British war zone in France, whatever their nominal status, all had in practice to do the work of casualty clearing stations. Consequently in Great Britain provision had to be made and to be maintained for sometimes vast numbers of men arriving almost straight from the field of battle. But apart from this it was a general principle in France, though not always observed, to evacuate to England at a relatively early date all cases likely to require prolonged treatment, unless they belonged to certain limited categories. In view of the huge casualties liable to occur in conditions of modern warfare, this procedure was inevitable since the British war zone in France was nowhere of any great depth; barely fifty miles of country stood between most of its coastal towns and the enemy trenches, and there was thus a very distinct limit to the possibility of arranging suitable sites for the innumerable stores, camps of all kinds, and hospitals required. The number of hospital beds habitually maintained was always greater than was pleasing to the High Command on account of the increased strain thrown on the transport and supply services, and it must have been a source of anxiety to the D.G.M.S. himself at critical moments brought about by enemy successes.

The United States Army, on the other hand, with its disembarkation ports on the Atlantic coast, could spread itself pretty much as it pleased over Western and South-Western France, and it was early decided to adopt the principle of not sending home any case likely to require less than six months' treatment. In short, for the United States soldier relatively few wounds spelt "Blighty" in the true sense of that word, although as a matter of fact, as shown in the first volume of our own *Medical History of the War*, some 13,000 sick and wounded from the American forces were taken to England between March and December of 1918.

Consequently in the United States itself the chief demand for accommodation would seem to have been in respect of cases of sickness and injury arising at the pre-war military posts and in new training camps, of which thirty-two were in use or in process of formation at the date of the armistice; also for similar cases among troops under orders for France and awaiting shipment at embarkation ports. But general hospitals were also provided for the treatment of special cases of all kinds and for the final treatment of any patients sent back from France. For the temporary reception of the latter prior to redistribution sundry debarkation hospitals were established in the neighbourhood of New York; for the treatment of cases of tuberculosis arrangements were made in suitable areas.

A further outcome of the relative limitation of the problem was that it does not seem to have been found necessary to provide more than about 120,000 beds, or, in other words, about one-third of the number habitually maintained in the United Kingdom; that of these 120,000 beds fewer than two-thirds were actually occupied at the date of the armistice. Nevertheless, with a view to future possibilities, plans were being made at that date for 60,000 more beds.

On the declaration of war the Medical Department received numerous offers of buildings for use as hospitals; it accepted many and transformed them as circumstances required, but the greater number of hospitals were specially built. As a rule they seem to have been single-story buildings, but the size of the ward units and their distribution differed considerably. Wards containing from 50 to 100 beds were considered most convenient for administrative purposes, and no objection to them on other grounds seems to have been experienced. In view of their special purpose it was anticipated from the beginning that the provision for sitting-up cases would have to be large, and in the event it was found that the proportion of men able to take their meals at the common table, and requiring more or less active exercise, was often 75 per cent., and even as high as 95 per cent., among cases sent back from France. A large number of the hospitals seem to have gone in for teaching their patients various trades, and some were definitely charged with reconstruction work.

Whenever possible every hospital was placed for administrative purposes under the command of an officer belonging to the Medical Service of the standing United States Army. His staff was formed of ordinary medical officers specially selected and trained for the purpose. On the professional side the work was divided into three services—medical, surgical, and laboratory—each working under a chief. The standard permanent staff for a 1,000-bed hospital was one colonel or lieutenant-colonel, four majors, twelve captains, and thirteen lieutenants, of the Medical Corps, two officers of the Sanitary Corps, two of the Dental Corps, one captain of the Quartermasters' Corps, one trained nurse for every ten patients, and two enlisted men for every five beds. In addition most of the hospitals had supplied to them a "dietetic specialist"—that is, a woman specially trained in sick-room cookery—and the chiefs of laboratories could increase their staffs by employing civilian assistants.

Perhaps one of the most striking features of the whole account is the great importance that was attached to administrative work in hospitals, and the number of medical officers set aside for this purpose. Another is the elaborate character of the arrangements made for the instruction of medical officers in military medicine and surgery, and for the bringing up to standard those whose general medical knowledge was deemed to be subnormal.

Incidentally the volume reveals that it was the intention of the United States Government to land in France by the middle of the year 1919 a total of 3,360,000 men, and to maintain in the home territory a reserve of a further 1,400,000. The volume, like the others to which we have drawn attention, is supplied with an exhaustive index, and gives, too, a sketch of the evolution of military hospitals in general. Credit for the first conception of the pavilion type of hospital is given to Stonehouse (Plymouth), where a naval hospital on this plan was built about the year 1754.

[1] *The Medical Department of the United States Army in the World War.* Volume V. Military Hospitals in the United States. Prepared, under the direction of Major-General M. W. Ireland, by Lieut.-Colonel Frank W. Weed. Washington: Government Printing Office. 1923. (Sup. roy. 8vo, pp. 857; 204 figures. 2.25 dollars.)

DIAGNOSIS AND TREATMENT OF NEPHRITIS.

THE first edition of Professor HUGH MACLEAN'S *Modern Methods in the Diagnosis and Treatment of Renal Disease* has, as anticipated in our review (1922, i, p. 146), met a distinct want, for there have been two fresh impressions, and a second edition,[2] somewhat enlarged and with some

[2] *Modern Methods in the Diagnosis and Treatment of Renal Disease.* By Hugh Maclean, M.D., D.Sc. Second edition, revised and enlarged. London: Constable and Co., Ltd. 1924. (Demy 8vo, pp. viii + 110: 4 plates, 4 figures, 2 charts. 12s. net.)

additions, has now appeared. On the basis of functional disturbance as determined by chemical tests, chronic nephritis is divided into two forms—the azotaemic, characterized by retention of nitrogenous products and corresponding to chronic interstitial nephritis, and the hydraemic form with retention of sodium chloride and oedema, the much less frequent parenchymatous nephritis. The chapter on this subject is enlarged by the addition of four successful coloured plates illustrating the histological changes, which have been provided by Dr. S. C. Dyke, pathologist to the Clinical Units at St. Thomas's Hospital. These plates show the complete absence of inflammation in hydraemic nephritis, and that when, as generally happens, the hydraemic form progresses into the azotaemic there is always, in addition to considerable degeneration of the renal cells, more or less well marked inflammation, as shown by definite proliferation of the interstitial fibrous tissue of the kidney. Occasionally the degenerative change responsible for the hydraemic form undergoes cure and the further lesion does not supervene. It is suggested that the toxin causing pure degeneration of the renal cells is not the same as that responsible for this degeneration when associated with interstitial inflammation; on this point, however, further information is necessary The plate showing the microscopic appearances of a primary chronic interstitial (azotaemic) nephritis is much the same as that in progressive hydraemic nephritis.

Another addition in this edition is in the section dealing with the high concentration of urea in the blood. There is a want of correspondence between the apparent clinical condition of patients with progressive hydraemic nephritis and the amount of blood urea, for the oedema may disappear and they may cease to vomit and yet have a steadily rising blood urea—a danger signal with a hopeless prognosis. These cases are comparable to those of subacute bacterial endocarditis with apyrexial periods where recovery appears probable, though a fatal termination always ensues. The discussion of high blood urea with healthy kidneys brings out possible pitfalls and fallacies, such as the danger of concluding that the combination of high blood urea and albuminuria justifies a diagnosis of uraemia, for this may be due to an abdominal abscess or empyema, when the percentage of urea in the urine will be fairly high—from 2.5 to 3. 5 per cent. or even more. In doubtful cases, therefore, the percentage of urea in the urine should also be estimated, for in the presence of 2 per cent. of urea in the urine the existence of uraemia can be safely excluded.

In conclusion, this condensed but clear account of the modern conception of renal disease should be in the hands of every general practitioner who has not recently revised his knowledge of the subject, so as to enable him to deal in a competent and up-to-date manner with his patients.

ANAESTHESIA: LOCAL AND GENERAL.

In the preface to his book *The Science and Art of Anaesthesia*[3] Colonel WEBSTER, M.D., who is professor of anaesthesiology in the University of Manitoba Medical School, states that he has written it in order to place before the medical student and general practitioner a small manual, concise in form, but not so brief as to leave matters imperfectly explained.

A short chapter on the history of anaesthesia is followed by a discussion of the physiology of the subject, which is well written, and though condensed should suffice for the average needs of the student. Each anaesthetic is then considered in turn, and there follows a chapter on local and spinal anaesthesia. Anaesthetic mixtures and sequences are next discussed, after which follow chapters on the selection of the anaesthetic, the nature of the operation, the heating of the gases, preliminary medication, and pre-operative and post-operative treatment. The effect of temperature and moisture on post-operative conditions is then described, and separate chapters are devoted to surgical shock, post-anaesthetic acidosis, the patient's viewpoint, the art of anaesthesia, statistics, anaesthesia records, and the medico-legal aspect of anaesthesia. The English student may find that the apparatus described is not all of a pattern with which he is familiar, but the illustrations, which are not too numerous, are quite satisfactory, and there is a commendable absence of misprints.

The second edition of the American translation of Professor BRAUN's book bears the title *Local Anesthesia: Its Scientific Basis and Practical Use*.[4] It is ten years since the first edition appeared, and in the meantime much has been written on the subject as the result of the great war. This second edition retains all the merits of the first. There are sixteen chapters: the first ten are devoted to general considerations, the last six to descriptions of the operations on the various parts of the body. The first chapter is on the history of local anaesthesia up to the discovery of cocaine, and is followed by others on sensation and pain, anaesthesia and anaesthetic methods, on the pain-relieving action of nerve compression and anaemia, on anaesthesia by means of cold, on the influence of the osmotic tension of watery solutions injected for purposes of local anaesthesia, on absorption, and so on. Local anaesthetic agents are then described, and the physiological and toxic properties of each fully discussed. Then follows a chapter on further aids to local anaesthesia, including such manœuvres as ligation of limbs, the chilling of tissues, and the action of adrenaline. Methods of using the drugs are next described, and the value, indications for, and general technique of local anaesthesia discussed; the instruments used, the solutions recommended, and the general technique of infiltration and conduction anaesthesia are fully explained. The illustrations, of which there is a sufficient number, are clear and well chosen. One point Professor Braun insists upon—the unsuitability of the modern operating table for the practice of local anaesthesia—should be emphasized. The modern table, while very convenient for the surgeon, is most uncomfortable for a conscious patient. A mattress covered with sterilized rubber sheeting should always be provided for a patient who is to undergo a long operation under local anaesthesia.

The book is a very fair presentation of the relative merits of local and general anaesthesia, for the author does not let enthusiasm for his subject outrun discretion.

ELECTROTHERAPEUTICS AND DIATHERMY.

THE first nine chapters of *Practical Electrotherapeutics and Diathermy*,[5] by Dr. MASSEY, deal with the various currents used in medical electricity, and occupy rather less than a third of the book. The nature of these currents, the machines which produce them, the methods of applying them, and their actions on the body, are described. The remainder of the book deals with the electrical treatment of disease.

In Chapter X, which is entitled "Electricity in General Surgery," are described electrical methods of treating aneurysm, cystic goitre, tuberculous glands, etc., and an account is given of a method of performing tracheotomy with a cautery knife. Chapter XI is entitled "Electricity in Industrial and Reconstructive Surgery," but, apart from a short section on the removal of lead and mercury from the tissues, deals entirely with electro-diagnosis and the testing of the reactions of muscle and nerve. "Electricity in Oncology" is the title of Chapter XII, the longest in the book (92 pages). In the remaining chapters (XIII to XIX) the electrical treatment of diseases of various regions and systems of the body is described.

The chapter which will arouse most interest among English readers is that on the treatment of malignant growths by zinc ions. The author has made a special study of this method for many years, and his results,

[3] *The Science and Art of Anaesthesia.* By Colonel William Webster, D.S.O., M.D., C.M. London: Henry Kimpton. 1924. (Med. 8vo, pp. 214. 24s. net.)

[4] *Local Anesthesia: Its Scientific Basis and Practical Use.* By Professor Dr. Heinrich Braun. Translated and edited by Malcolm L. Harris, M.D. Second American from the sixth revised German edition. London: Henry Kimpton. 1924. (Roy. 8vo, pp. x + 411; 231 figures. 25s. net.)

[5] *Practical Electrotherapeutics and Diathermy.* By G. Betton Massey, M.D. London: J. and A. Churchill. 1924. (Med. 8vo, pp. xvi+401; 157 figures. 21s. net.)

judging by the illustrations and descriptions, seem to be excellent. The patients have been kept under observation for not less than two years. His method is described in full detail. Usually multipolar electrodes are used, and constant unidirectional currents of 2,000 or even 3,000 milliampères are concentrated in and around the growth. With currents of this intensity heat is also developed, and a temperature sufficient to coagulate the proteins is reached. The method is therefore one of diathermic coagulation combined with chemical cauterization. It might be thought that risk would attend the use of currents of this kind and strength, even though the electrodes are confined to the site of the growth, but no misadventure is reported.

The author's observations on the treatment of tuberculous glands and cystic goitre by germicidal and cauterizing ions will be read with interest. He has devised special methods which, in his hands, seem to have produced good results.

In the account of the testing of electrical reactions attention is paid chiefly to the original method, in which the faradic and galvanic currents are used. The account of the condenser method and the description of the selective stimulation of denervated muscles in the way recommended by Lapicque are taken from the writings of other authors. A wrong impression is given of the meaning of the term "chronaxie." The definitions given on page 41 confuse ionization with cataphoresis. Such expressions as "the soapy ions of sodium and hydrogen," "the cations of water" (p. 41), and the statement that 2 per cent. is "usually the strength at which the molecules of a substance are most fully ionized by water" are unscientific and inaccurate. There are certain other mistakes and inaccurate expressions in different parts of the book. Thus we read on page 133 that "ozone and nitrous oxide will appear in great abundance at the surface of the positive pole, . . . while the negative polar surface will receive a similar blast of nitrogen."

The book is more suitable for the advanced reader than the beginner. Those who are experienced in electrotherapeutics will find much that will interest them, especially in the chapter on the destruction of new growths.

AN ATLAS OF ANATOMY.

THE *Hand-Atlas of Human Anatomy*,[6] by Professor SPALTEHOLZ, has entered its seventh German and its fourth English editions, and may, we think, be said to be without any serious competitor in its own particular field. The illustrations have now reached the formidable total of 994—a considerable advance on the number in the previous English edition; the increase is largely attributable to the addition of figures illustrating the development of bones, made from specimens prepared by a method of Professor Spalteholz's own invention. With this large number of figures it has been possible to ensure that every part of the body is adequately illustrated in various stages of dissection and from almost every conceivable point of view. The dissections have been made with great skill and ingenuity; the standard of reproduction is consistently high, whether judged from the point of view of accuracy, clearness, or artistic merit; the artists are particularly successful in their manipulation of light and shade, an important feature in anatomical drawings. While most of these drawings are faithful representations of dissections, with sufficient discriminative arrangement and selection to emphasize the relationships which it is desired to show, the author does not hesitate at times to introduce figures of a diagrammatic type; certain of these, in connexion with the anatomy of the central nervous system, are particularly successful and commendable. At times, too, figures are included of parts as seen with low magnification. Perhaps some idea of the completeness of the work may be obtained from noting that no fewer than forty figures are assigned to the organ of sight and forty-three to that of hearing. At the foot of each figure is a compendious legend, so that in a sense the Atlas partakes of the nature of a textbook. The work is singularly accurate, although very occasionally minor faults can be detected in labelling or in colour registering. The Atlas is so complete and perfect as to present a very strong temptation to the student to substitute it for his own dissections, but perhaps the price of the book and the influence of his teachers will constitute adequate safeguards. It is as a work of reference that it will be of most assistance and utility.

[6] *Hand-Atlas of Human Anatomy.* By Werner Spalteholz, Professor of Anatomy in the University of Leipzig. Edited and translated from the seventh German edition by Lewellys F. Barker, Professor Emeritus of Medicine, Johns Hopkins University. Fourth English edition. Three volumes. Philadelphia and London: J. B. Lippincott Company. 1923. (Sup. roy. 8vo, pp. 902; illustrated. 70s. net the set of three volumes.)

WHITE MEN IN THE TROPICS.

THOUGH the interest of the home country in the effect on white races of residence in hot countries may have been diminished by recent political tendencies, the questions involved are of great and even growing importance for certain of the dominions, and in particular for Australia in respect of Queensland. We therefore draw attention to an extremely pessimistic essay published in a small volume[7] by a French author, whose sex and status are not indicated on the title-page. Sundry passages in the text, however, justify the conclusion that it is from the pen of a medical man of long experience in the colonial service of the French Government. His statements relate solely to the assumed effects of long exposure to heat; those of the diseases more or less endemic in tropical zones are excluded from consideration.

He does not believe that there is ever any true acclimatization of white folk, and he does believe that long before the attainment of any condition that could reasonably be given that name most individuals would have seriously degenerated both physically and psychically. Among the physical degenerations are marked prominence of the abdomen, atrophy of voluntary muscles, displacement of various abdominal organs, baldness, or premature whiteness of the hair, and a relatively early onset of old age often coupled with arterial sclerosis. The first three phenomena, he says, are so common and so often combined that when accompanied by a bronzed skin the individual, he declares, looks like a frog, and wherever met can at once be recognized as a "colonial," by which term the French seem always to mean a Government or commercial employee in a hot country. The individual looks like a frog because a sunk chest and a large stomach are supported on a thin pair of legs and balanced by attenuated arms; by the precise tone of the face colour, an expert can even tell from what particular marsh this human bactrachian hails. Seemingly those who attain this appearance are rather to be congratulated than otherwise, since only the sickly remain thin. It is asserted, too, that individuals who after having become nominally acclimatized return to live at home generally get killed off by influenza or some congener in a very short time. Doubtless this is a subject of regret to their friends, but if our author's statements are to be taken at their face value it must from the general standpoint be considered rather a good thing. For if the physical results of long subjection to heat are uninviting, the psychical results would seem to be still more unhappy. The length of service of a white resident in the tropics can, our author says, be told by the degree of his conceit and self-assurance, of his assumption of medical knowledge, and of other kinds of culture which he does not possess, and of his readiness to rush into print. If some piece of work of his, such as the building of a bridge, fails, it is never his fault but someone else's, and as he grows older he tends to become extremely pompous and to use none but sententious language. At all stages he is ready to quarrel about nothing, to indulge heavily in alcoholic drinks, to try all sorts of weird narcotics, to get so physically lazy as to be unwilling to walk even a few yards, to lose all moral sense, and, especially if his work lies among the bush natives, to become a veritable satrap; meanwhile he is lucky if he

[7] *Les Blancs en pays chauds: déchéance physique et morale.* Par Jaureguiberry. Paris: A. Maloine et Fils. 1924. (Cr. 8vo, pp. 60. Fr. 6.)

does not develop a phobia of some kind or lose all will power. A further effect of the sun is said to be heightening of the imagination which leads the victim, if engaged in conversation, to swamp his companions by his volubility and fearless disregard for truth. The effect on white women residents is of a corresponding kind, and when not engaged in dress competitions they endeavour, morally speaking, to wear their husbands' trousers.

Most of us are acquainted with many individuals who after spending most of their lives in hot countries remain of good physique, and couple with a broad experience of life a mentality fully equal to that of such of their coevals as have remained at home. The statements of our author will therefore be received with distrust both in France and in this country. Hence it should be added that he concludes his volume with a number of much more acceptable statements. Summed up, they are to the effect that both the French Government and French commercial houses should reject for employment in hot countries home failures, and should choose none but men of the very highest types they can get. The age limit should be not less than 25 on first appointment, and at the age of 50 they should be retired. Meanwhile they should be sent on long leave at the lapse of every two years, and all forms of physical activity among them should be encouraged. Subordinate posts should be filled solely by natives, and the recent tendency in France to regard its tropical possessions as suitable places for ordinary domestic life, including the raising of families, should be discouraged. The author also holds that the English practice of living isolated from natives is sound, and that the French readiness to welcome in France men of colour of all kinds, and to treat them as equals, is to be regretted. There can be no true acclimatization, he holds, either of white folk in tropical zones, or of coloured races in European countries, and sooner or later, if current tendencies continue, the French race, as a race, may suffer accordingly.

THE UNADJUSTED GIRL.

THE fourth Criminal Science Monograph, published as a supplement to the *Journal* of the American Institute of Criminal Law and Criminology, is entitled *The Unadjusted Girl*,[8] and is edited by WILLIAM I. THOMAS, with a foreword by Mrs. W. F. Dummer. A quotation from the prefare will show the motive inspiring this book: "Modern psychology is throwing so much light upon human behaviour that, concerning delinquency, one cannot do better than follow the teaching of Spinoza, 'Neither condemn nor ridicule, but try to understand.'" Such an attitude led to the widespread sociological study of delinquency, and later to the establishment of the first mental clinic in connexion with a court. A great number of case histories are reported at length in the book, and from these psychological arguments are deduced. The editor remarks, however, that—

> "Statistics in themselves are nothing more than the symptoms of unknown causal processes. A social institution can be understood and modified only if we do not limit ourselves to the study of its formal organization but analyse the way in which it appears in the personal experience of various members of the group and follow the influence it has on their lives."

Mrs. Dummer quotes from James Hinton, the English surgeon, who said just after the American civil war: "Prostitution will pass as has slavery when it becomes too great a burden for humanity to carry." Prostitution and promiscuity, she considers, will be eliminated, not by force, but through sublimation.

The editor interprets to-day's unrest as a period of individualization following and preceding periods of socialization, and emphasizes the present opportunity to reorganize the administration of justice.

The titles of the chapters sufficiently indicate the scope of the book—"The Wishes," "The Regulation of the Wishes," "The Individualization of Behaviour," "The Demoralization of Girls," "Social Agencies," and "The Measurement of Social Influence." Each chapter is amplified by full notes from many cases.

[8] *The Unadjusted Girl.* By William I. Thomas. Criminal Science Monograph No. 4. London: George Routledge and Sons, Ltd. 1924. (Demy 8vo, pp. xvii + 251. 15s. net.)

NOTES ON BOOKS.

THE issue of the fifth edition of the useful handbook *Anaesthesia in Dental Surgery*[9] follows close on the death of its originator, Dr. T. D. LUKE. The editor of the new edition, Mr. J. Stuart Ross, pays a tribute to him in the opening lines of his preface. Though the book has been entirely rewritten and has materially gained thereby, the impress of its first author remains. In particular the chapters on gas and oxygen and on local anaesthesia (rewritten by Major W. T. Finlayson) have been greatly improved. The replacement of an index by a synopsis and cross-references we do not consider an improvement, even in a small book. As an example, the only reference to acidosis we can find is in the very interesting chapter on ethyl chloride, and it is noted in connexion with children only; the condition is of importance in all cases of general anaesthesia and at all ages, and an index would quickly have revealed the author's position. In the chapter on chloroform the author fights well the battle of "safety first," and, while admitting that there are cases where chloroform *must* be given for dental extraction, strongly advises against its general use. We note in the chapter on nitrous oxide and oxygen the statement that analgesia is a stage reached before the loss of consciousness, and that even live pulps can be extirpated painlessly during this stage. We venture to ask the author whether there be any such stage during "gas" (or "gas" and oxygen) administration. Our experience is that pain is more acutely felt at the moment of losing or regaining consciousness. There are a few lapses from English pure and undefiled, as at the bottom of page 136 and in the tautology of the second paragraph of page 189, which are worth attention in a book so pleasantly written. Both for its contents and its diction we recommend it to those for whom it is specially intended—the dentist and those medical practitioners who would understand what the dentist requires of the anaesthetist.

Dr. HANS ZINSSER'S work on infection and resistance, of which the third edition has recently been published,[10] is, as its subtitle states, "an exposition of the biological phenomena underlying the occurrence of infection and the recovery of the animal body from infectious diseases, with a consideration of the principles underlying specific disease and therapeutic measures." The opening chapters deal with the problem of virulence, the varieties of bacterial poisons, and the question of immunity, and are followed by a discussion of toxin and antitoxin, the bactericidal properties of blood serum, cytolysis and sensitization, and the complement and its practical applications. The phenomena of agglutination, precipitation, phagocytosis, and chemotaxis, are described, and several chapters are given to anaphylaxis, serum sickness, and the allied subjects of food and drug idiosyncrasy and hay fever. The concluding chapters deal with active and passive immunization and protein therapy.

We have received the first two publications[11] of the Ravetllat-Plá Institute of Barcelona, in which a new conception of the bacteriology and pathogenesis of tuberculosis is set forth. The first publication is a lecture delivered in June, 1922, by Dr. R. PLÁ Y ARMENGOL, and the second is the conjoint work of the late veterinary surgeon J. RAVETLLAT and Dr. PLÁ Y ARMENGOL. The writers maintain that the organism of tuberculosis may appear in three different forms, each of which may be transformed into the other—namely, a diplococcus or diplo-streptococcus, which they call the attacking bacterium, an intermediate or transitional form, and Koch's bacillus. The attacking bacterium, which is always found in the active lesions and the internal organs, especially the spleen, possesses great vitality. Under unfavourable conditions it loses part of its vitality and becomes converted into the intermediate bacterium in the form of granules, which represents the first phase of resistance, and is chiefly found in the pus. Under still more unfavourable conditions the organism assumes the form of Koch's bacillus, which represents the phase of maximum resistance and is most frequently found in the tubercles.

[9] *Anaesthesia in Dental Surgery.* By the late Thomas D. Luke, M.D., F.R.C.S.Edin. Edited by J. Stuart Ross, M.B., F.R.C.S.Edin. Fifth edition. London: William Heinemann. 1924. (Crown 8vo, pp. xiv + 238; 45 figures. 10s. 6d. net.)

[10] *Infection and Resistance.* By Hans Zinsser, M.D. Third edition. New York: The Macmillan Company. 1923. (Med. 8vo, pp. 666; illustrated. 24s. net.)

[11] *Concepto Clínico de la Tuberculosis según la Bacteriología y Pathogenia de Ravetllat-Plá.* By Dr. R. Plá y Armengol. 1922. *La Bacteria de la Tuberculosis.* By J. Ravetllat and R. Plá y Armengol. 1924.

Nova et Vetera.

DR. JOHN BASTWICK.

MUNK'S *Roll of the London College of Physicians* is perhaps more often used as a source of instruction than amusement, although it contains many good stories. Munk's virtues are not very attractive to most people, and his failings are, we suspect, repellent to the youth of this generation. Munk loved a scholar and a gentleman of the old school; he thought it was a point in a physician's favour to be able to write good Latin, and he had very little sympathy with rough, quarrelsome folk who did not behave like gentlemen and scholars. With a subject like Sir George Baker, Munk was at his best, but he was a little unhappy about and puzzled by Sydenham's neglect to become an F.R.C.P., and he could see no redeeming features in the career of Dr. John Bastwick.

Bastwick was indeed no gentleman—in the Munkian sense. To begin with, although he was entered at Cambridge, he never took a degree there. Then, "apparently not satisfied with his progress in the profession," says our annalist, "and being a man of strong zeal and warm imagination, he applied himself to writing, more particularly against Popery." This rude behaviour led to a fine of £1,000, excommunication, prison, and removal from the list of Licentiates. Even this did not crush the rebel. "His violent temper," says Munk, "would not permit him to be quiet." He became even ruder than before, and in 1637, after arraignment in the Star Chamber, when, as Munk says, he expressed himself in "extraordinary terms," he lost his ears and was packed off first to Launceston and then to the Scilly Isles to await the time when the proceedings against him were reviewed in the House of Commons—possibly in extraordinary terms—and in the College.

"D. Presidens et Censores judicabant D. Bastwick in locum quem habuit in Collegio et ad libertatem praxios restituendum; et amota superiorum censura pro restituto habendum et accipidendum apud omnes Socios, Candidatos et Licentiatos."

This was in 1640. He was to have had money compensation from the estates of the Archbishop of Canterbury, but it does not appear that he ever received it; his affairs were still under discussion in Parliament in 1648.

"What became of him after that is not known. It is generally thought that he returned to Colchester. He died apparently in London. Smith records his burial on the 6th October, 1654."

Such was the career of Bastwick according to Munk. The facts are no doubt correct, but there seems something wanting in the interpretation. It seems incredible that a man, however violent his temper, would think that attacks on the best people would be a professional recommendation in 1633; Bastwick was a college physician, not an empiric. So it is easier to believe that violent temper, rather than fewness of patients, was the motive, and charitable to think that some courage went with the violence of temper.

An examination of the proceedings against Bastwick, Burton, and Prynne for several libels, in the *State Trials*, bears out this view. Bastwick was certainly "no gentleman," but some of the "extraordinary terms" not quoted by Munk suggest that in addition to a violent temper he had both courage and wit. For instance, we find this dialogue:

Lord Keeper: "What say you, Mr. Doctor, are you guilty or not guilty? Answer yea, or no: you needed not to have troubled yourself so much about so large an Answer."

Dr. Bastwick: "I know none of your Honours have read my Book; and can you with the Justice of the Court, condemn me before you know what is written in my Books?"

This was a facer, because the court had certainly not read them (they seem to have been rather long), so the doctor was asked about an extract which had been read in court, and replied:

"My Lord, he that read it did so murder the sense of it, that had I not known, what I had written, I could not tell what to have made of it."

After a few more exchanges, Lord Arundel moved the court to take the case *pro confesso*, which was allowed, whereupon Bastwick said:

"My noble Lord of Arundel, I know you are a noble prince in Israel and a great Peer of this Realm; there are some honourable Lords in this Court, that have been forced out as Combatants in a single Duel; it is between the Prelates and us, at this time, as between two that have appointed the Field. The one being a Coward goes to the Magistrate, and by Virtue of his Authority disarms the other of his Weapons, and gives him a Bullrush, and then challenges him to fight. If this be not base Cowardice; I know not what belongs to a Soldier. This is the Case between the Prelates and us, they take away our Weapons (our Answers) by virtue of your Authority, by which we should defend ourselves and yet they bid us fight. My Lord, doth not this savour of a base cowardly Spirit? I know, my Lord, there is a Decree gone forth (for my Sentence was passed long since) to cut off our Ears."

The Lord Keeper was much shocked by this insinuation and asked, "Do you prophesy of yourselves?" It was at least an accurate prognosis. Dr. Bastwick's speech before torture is not so fully reported as that of his more famous fellow sufferer Prynne, and is, for the most part, in common form, but there is a touch of rough humour in his addition to a criticism by Prynne of the writings of one Heylin.

"There is another book of his licensed," said the doctor, "wherein he rails against us three at his pleasure, and against the Martyrs that suffered in Queen Mary's days, calling them Schismatical Hereticks; and there is another book of Pocklington's licensed: they be as full of Lyes as Dogs be full of Fleas; but were the Presses as open to us as they are to them, we would pay them, and their great Master that upholds them, and charge them with notorious Blasphemy."

The party of Bastwick won in the end, and the foreshortening of historical perspective leads us to underestimate the courage needed to be on the winning side before it was the winning side. King and Archbishop lost their heads—and it is worse to lose one's head than one's ears. But it is not pleasant to lose one's ears, and the violent-tempered doctor deserved a kindlier epitaph than he received from Munk.

PUBLIC EDUCATION IN HEALTH.

SIR GEORGE NEWMAN'S MEMORANDUM.

PUBLIC education in health is the subject of a memorandum by Sir George Newman addressed to the Minister of Health and published by H.M. Stationery Office at the price of sixpence. It is a pamphlet of only thirty-five pages, but in that brief space its author succeeds in presenting a remarkably comprehensive survey of the whole subject with which he deals.

In a prefatory note Sir George Newman holds that the time has come when, notwithstanding the scope and character of the voluntary health movement in this country, the responsibility of central and local authorities for education of the public in respect of health should be more fully appreciated, "particularly in view of the fact that our national health organization has not kept pace with our advance in the science and art of preventive medicine." In the first section of the memorandum he insists that this advance in knowledge can do nothing of itself to safeguard health "unless it be *understood, accepted, and practised*," and he quotes the late Professor Sir Henry Jones of Glasgow as declaring that—

"the best State is that which both does most for the individual and enables him to do most for himself. . . . I do not doubt for a moment who our ruler is about to be in State and city. *It is public opinion* . . . the State is not safe unless public opinion is enlightened opinion; and the task of converting public opinion into educated opinion is so vast as to require the best powers of us all."

It is in that spirit and from that point of view that the Minister of Health's chief medical officer addresses him.

Going on to deal with the personal aspect of preventive medicine, he illustrates his views of the importance of individual appreciation of health in relation to sanitation, disease of the respiratory tract, digestive disturbance, dental decay, infectious diseases, maternal mortality,

infant mortality, rickets, cancer, and nervous and mental troubles, and he urges the importance of periodical physical examination—a subject which, it may be mentioned in passing, was pressed on the attention of the Royal Commission on the Poor Law, but without any success.

Central Authorities' Work.

Turning next to the educational work of the Ministry of Health and Board of Education, he remarks that the former body acts mainly indirectly, through the local authorities, and by inspections, interviews, correspondence, annual reports, special reports, circulars, and other documents. Also it subsidizes local authorities in portions of their services which may include educational and propagandist work. It furnishes public health news in answers to questions in Parliament, in communications to the press, and in replies to inquiries. The Board of Education has direct educative duties, instruction in hygiene and physical training being within the school curriculum. The Board has issued also a series of syllabuses on the subject of health, and for these there has been a good demand. "There is no subject in the school curriculum which has a more romantic story behind it than the triumphs of the progress of hygiene during recent years. Such instruction should be given in the simplest language, and should be woven into the geography and history of the world or associated with the great discoverers of modern times—Harvey, Jenner, Simpson, Pasteur, Koch, Lister, Manson." Besides medical inspection and treatment of school children, the Board has encouraged schools for mothers, which have been remarkably successful.

Local Authorities' Work.

Leaving the central authorities, the educational work of local authorities is next commented on. Reference is made to regulations relating to tuberculosis, venereal disease, maternity and child welfare, and the Rats and Mice (Destruction) Act. It is urged that the law should be made clear as to the powers of local authorities to spend money on health propaganda. Insurance committees are clearly endowed with such a duty and responsibility, and some have performed it, but of far more importance than any statutory sanction "is the educational work naturally and properly performed by the insurance practitioner in the ordinary discharge of his duty to the patient." Much excellent teaching has been done by medical officers of health in their annual reports, whilst some county and borough councils (London, Marylebone, Blackburn, and others) have been very helpful in various directions—the issue of pamphlets and leaflets, the promoting of baby weeks, health weeks, rat weeks, the delivery of lectures, the holding of exhibitions, and by education through local journals.

Voluntary Work.

Leaving central and local authorities, the educational work of voluntary bodies is next dealt with. These are in many ways able to permeate the minds of the people with new knowledge of practical value, to lead public opinion in support of government and the best ways of progress, and to inform official bodies of their experiences among the people. Voluntary societies are now surprisingly numerous. The memorandum gives a list of twenty-three, and briefly indicates their special objects. The first was the British Red Cross Society, founded in 1870, and the most recent mentioned is the Central Council for Infant and Child Welfare of 1919. Sir George Newman is of opinion that—

"we are gradually coming to that stage of enlightenment at which public opinion is able to sort out the good from the bad, to discriminate between those measures that are for the public well-being and protection, and those that are merely to serve passing political advocacy, particular classes of society, or the ends of vested interests. Hence the co-ordination between the various voluntary health organizations on the one hand, and the authorities responsible for local and central government on the other, is of increasing importance and necessity."

"Public health education in other countries" is the title of the next section of the memorandum. The United States takes first place here. The Federal Public Health Service provides a scientific basis in periodic and special reports, lectures, articles, cinema films, and broadcasted messages. The department distributes information, but does not conduct propaganda. In most of the individual States and larger cities there is a propaganda division in the Department of Health, providing press articles, lectures, pamphlets, and leaflets. The methods pursued in Pennsylvania include a quarterly *Journal of Public Health*, a fly campaign every springtime, a campaign for periodic medical examination of individuals, health lessons, information to newspapers, weekly health "talks" by a large number of prominent physicians, motion pictures, lantern slides, etc., and comprehensive distribution of literature, charts, exhibition materials, leaflets, and so forth. Other States act similarly, and a great life insurance company has trained its agents in popular health instruction as well as employing visiting nurses, issuing literature, and arranging for lectures. Canada acts on the same lines, also New Zealand, and the subject is being considered in South Africa and Australia. Much educational work is being done in France, Germany, Serbia, and Jugo-Slavia, but much less in Soviet Russia, where "very little money is available for public health activities," though the authorities are concentrating on propaganda.

Observations and Conclusions.

The final part of the memorandum is entitled "Some general observations and conclusions." As regards the present position in England and Wales, it is pointed out that the policies and administration of different countries are not comparable, and there should be no slavish imitation. The local authorities and their officers and the voluntary societies do much educational work, though instruction relevant in one area may be superfluous in another. The work of the local authorities is likely to be better in kind and degree and more timely, while that of the voluntary societies may be more stimulative and even critical, and may possess a missionary zeal and public spirit lacking in the routine of the health authority. Now that the comprehensive sanitary system and relatively advanced health service are generally accepted and settled, there is need for discrimination and differentiation of function. Some voluntary work has tended to be sporadic, perfunctory, and inexpert. Overlapping has not been without advantage, but technique leaves something to be desired, and leaflets, posters, etc., have not always been attractive or persuasive, though the pamphlets of the League of Red Cross Societies are admirable. There are two objects: first, to arouse enthusiasm and awaken a health conscience, in other words to stimulate; and secondly, to disseminate knowledge—to instruct. The teaching should suit the requirements of the taught, and careful attention should be given to the distinction between the objects—to interest, to instruct, and to secure that the instruction be acted on.

The forms of public education in health require full and careful consideration—lectures, leaflets, films, baby weeks, food exhibitions may or may not be suitable or timely and may or may not harmonize with local collateral services or facilities. Misplaced propagandism may be very harmful, and much may be lost by unwitting misrepresentation of facts and remedies, both as to value and practicability. There are two chief forms of public education in health: "(1) the regular process of education inherent in the effective discharge of the public health services; (2) exceptional advocacy, propagandism or supplementary teaching by other means." Sir George Newman holds that the former of these is the better, and illustrates this by depicting a population of 100,000 with its 16,000 children of school age, its 35,000 insured, its 2,000 expectant mothers yearly, its 1,000 tuberculosis cases, all duly looked after. He says that there are, however, three reasons why the State organization needs supplementing by other methods. These are, very briefly, that the statutory system cannot exercise control of personal health and habit; that it requires *impulse* from the people as a whole to make it effective; and that the people "require instruction in understanding, using and putting into operation the public provision made on their behalf." The methods for providing supplementary teaching by local authorities or voluntary societies are manifold and varied, and the choice must depend on circumstances, conditions, persons, means, and resources.

The conclusions with which the memorandum finishes are such that they cannot satisfactorily be condensed and are therefore quoted in full:

CONCLUSIONS.

In summary, it must be said that there is great and exceptional need for public education in health. First, there has been a growth of knowledge in the science and art of medicine and its application to many morbid conditions now known to be preventable; secondly, there has been a rapid development of the whole system of sanitary governance and public medical services—*and public opinion has not kept pace with these two profound changes.* Yet without an enlightened public opinion the measure and value of scientific and legislative advance is impaired. It is true that attempts have been made—all of them public spirited, many of them gallant, and a few of them even heroic—by the voluntary service of persons or societies to meet this situation and fill the breach. On the whole these efforts have met with encouraging, and sometimes enduring, success. But such enterprise is in need of guidance and support, and is liable to some degree of misdirection. It lacks unity, tends to become chaotic, is without adequate supervision, and is, all too often, insufficiently related to the new knowledge and the expanding organization.

My submission is that the educational functions of local authorities and voluntary societies require, at the present juncture, fuller and more careful consideration and more effectual organization.

(*a*) All local authorities are indirectly engaged in educational work inseparable from the effective discharge of their statutory duties under the Public Health Acts, and this aspect of their services is paramount. It is on the whole the most important and universal form of public education in health.

(*b*) Some local authorities, in addition, are undertaking supplementary educational work of a more direct nature, though others are, or deem themselves to be, debarred or at least restricted in this more direct sphere of education. It seems to me desirable that any ambiguity on this point, or in the law itself, should be removed as soon as possible, so that upon all local authorities there should be imposed a power or a duty of direct educational work.

(*c*) Then I think the time will have come for the Government to consider whether such educational work is of sufficient importance and value to be assisted financially by an Exchequer grant under the Ministry of Health, which would naturally take the form of a provision available to local authorities for certain approved types of educational work in hygiene.

(*d*) Lastly, these two steps in re-defining the powers under which educational work is undertaken by a local authority, and encouraging its development, will inevitably raise the question of the extent to which, and the terms on which, voluntary societies should also officially participate in the more direct form of such instruction (as distinct from the indirect educational work inherent in an efficient sanitary service). On this subject it would not be appropriate for me here to say more than that, in my opinion, it is the local authorities who must be directly responsible for undertaking educational health work, direct as well as indirect, suitable to their own district, circumstances, and needs, with such supplementary special assistance as the voluntary societies concerned may find themselves able to afford.

THE HEALTH ORGANIZATION OF THE LEAGUE OF NATIONS.

[FROM OUR CORRESPONDENT AT GENEVA.]

AT the meeting of the Assembly of the League of Nations at Geneva on September 20th, Dr. R. V. Caballero, the delegate for Paraguay, made a statement on the Health Organization of the League.

He stated that under the auspices of the League training courses in epidemiology and sanitary practice had been established during the past year in certain towns of Eastern Europe (Warsaw, Kharkov, and Moscow); an inquiry had been conducted in Russia into the efficacy of vaccination per os against cholera, dysentery, and typhoid fever; and a mass campaign in favour of vaccination had been carried out in Greece at the request of the Greek Government. A service of epidemiological information had been created, and was now in regular correspondence with the sanitary administrations of 26 European states, 13 American republics, 16 African colonies, 12 countries in Asia, and with Australia and New Zealand. Epidemiological and statistical researches of a more special nature regarding notification of cerebro-spinal meningitis, the incidence of scarlet fever and diphtheria, the area of extension of Asiatic cholera, rhinoscleroma, leprosy, tuberculosis, and cancer were at present being undertaken.

Special attention had been given by the Health Organization of the League to the problems, both prophylactic and therapeutic, connected with sleeping sickness in Central Africa. A committee of experts had been appointed to study these problems, and this committee would present recommendations intended to serve as a basis for agreements to be concluded between the British, Belgian, French, and Portuguese colonies, which would provide means of effectively combating this terrible scourge. A special committee had also been appointed, under Professor Léon Bernard of Paris, to study the question of instruction in health and social medicine in Europe, America, and Japan. The activities of the Organization had not been confined to epidemic diseases. It had also studied, on a large scale and from its international aspect, the question of the campaign against malaria. A committee on malaria, comprising specialists of various countries, including two—Germany and Russia—which were not members of the League, had been constituted for the purpose of studying the best prophylactic and therapeutic methods. This committee was to carry on investigations in the countries most subject to malaria. It had already visited this year the Serb-Croat-Slovene State, Greece, Rumania, Bulgaria, Russia, and Italy. It was thus able to form an idea on the spot of the difficulties experienced by the various local administrations in combating malaria. An allied question was that of the production of quinine; the co-operation of four experts belonging to different countries had been secured, and they had undertaken the task of examining problems connected with the manufacture and supply of this drug and the other cinchona alkaloids. An international conference on quinine was to be held as soon as sufficient scientific data had been collected.

In speaking of the international exchange of sanitary personnel and specialists, Dr. Caballero said that in 1924 the number of officers taking part was 99, and they belonged to twenty nationalities. The number of general annual interchanges had been fixed at four, for a duration of about seven weeks, each interchange to comprise a maximum of twenty persons. Two special interchanges (malaria, tuberculosis, school hygiene, and statistics) had also been arranged for annually, with a maximum of ten persons for each interchange.

The Health Organization had also begun to examine the extremely delicate problem of drafting Health Conventions on problems which extended beyond national limits and became questions of international public health. A proposal was at present being considered from the Netherlands Government, relating to *libre pratique*—that is, the exemption of vessels which have received health certificates in a properly equipped port from further sanitary inspection when they touch other ports. The proposal is being studied, but the feeling is that the time is premature for a general application of such a procedure. A model health convention regulating traffic on waterways of international concern was now under consideration. The final diplomatic signatures were now being exchanged for the ratification of the Health Convention concluded between Austria and the Serb-Croat-Slovene State. (This Convention is the last of a series of seven drafted as the result of the Sanitary Conference held in Warsaw in 1922, and intended to act as a "sanitary barrier" in Eastern Europe.) The important work on the standardization of serums and biological products* had been continued.

In conclusion he pointed out how undesirable it would be to curtail the estimates for the health work of the League, and stated that in the committee which had been considering the subject the British, French, Italian, Brazilian, and Japanese delegates had all supported the proposal to continue the international exchange of sanitary personnel and specialists.

After a brief discussion the Assembly passed unanimously a series of resolutions. These approved the work generally, especially of the service of epidemiological intelligence and public health statistics, and the results obtained from the carrying out of the system of interchanges. The Assembly considered that the most valuable results might be anticipated from an inquiry which has been undertaken into mortality from cancer, and praised the work of the Malaria Committee.

Further resolutions which were carried approved the establishment of a bureau of epidemiological intelligence in the Far East, requested the Health Organization to take into consideration the study of the problem of physical education and to investigate the means for its general extension on rational principles, and further requested the Organization to undertake an inquiry into the value of preventive measures against tuberculosis. This last proposal was on the initiative of Professor Pitamic, delegate for the Serb-Croat-Slovene State, and his idea was to have an inquiry similar to that already undertaken in respect of malaria and other diseases.

* We hope to publish a more detailed account of this prolonged and complicated work in a future issue.

British Medical Journal.

SATURDAY, SEPTEMBER 27TH, 1924.

THE SURGICAL TREATMENT OF ANGINA PECTORIS.

DURING the last twenty years excision of the cervical sympathetic has been advocated for a number of diverse diseases. Although the results in a large proportion of the conditions for which the operation has been performed have proved useless or disappointing, the brilliant work of Jonnesco and others has demanded increasing attention. The numerous important publications of Jonnesco and the recent lecture delivered by Professor Wenckebach[1] have awakened great interest and introduced the profession to the possibilities of surgical relief for the distressing symptoms of angina pectoris. The wide interest which has been aroused may in some measure be estimated by the appearance in current literature of a number of important contributions to our knowledge regarding the structure and function of the sympathetic nervous system, and by the publication of numerous articles upon the surgical technique in the operation of sympathectomy. We publish to-day (p. 553) a contribution by Professor Daniélopolu of Bucarest in which he discusses the physiology and pathology of the production of anginal symptoms. He adduces arguments in favour of the surgical procedure of section of the sympathetic chain, and opposes cervical sympathectomy.

Recently, however, A. E. Halstead and F. Christopher, of the University of Illinois Medical School, have reported[2] a case of angina pectoris relieved by partial cervical sympathectomy, and have placed on record a modification of the approach recommended by Jonnesco. In order to reach the cervical sympathetic they prefer to make an incision along the anterior instead of the posterior border of the sterno-mastoid, and then retract the muscle and the carotid sheath with its contents posteriorly rather than anteriorly. On anatomical grounds this procedure appears to present distinct advantages, because the approach to the cervico-thoracic ganglion is rendered more direct and greater freedom for manipulation is permitted. As it is this stage of the operation which offers the most formidable difficulties, any advantage at this point is of the greatest value. Apart from this modification, Halstead and Christopher performed a partial cervical sympathectomy, the middle ganglion alone being removed by avulsion. Although a number of surgeons have now reported successful results after excision of one ganglion or even division of the sympathetic cord, Jonnesco in a recent monograph expresses disapproval of the limited procedures and states that total resection of the cervico-thoracic sympathetic is the only intervention really indicated. This decision was probably arrived at owing to the complex arrangement of the branches of the sympathetic, and to our incomplete knowledge of the nervous pathways involved in the manifestations of angina pectoris.

In addition to indicating some of the difficulties at present confronting us with regard to the surgical treatment of angina pectoris, the question must also be raised of the serious sequelae which may follow such an extensive excision. Several deaths have followed complete sympathectomy, and it is clear that a more conservative operation is to be preferred. To make sure of interrupting a sufficient number of the afferent aortico-cardiac fibres by total removal of the cervical sympathetic very widespread and profound consequences must be risked, and Wenckebach has stated that the ideal operation would be to divide the afferent fibres from the heart and aorta and leave the efferent intact. With this end in view, what is thought to be the depressor nerve in man has been divided on several occasions with beneficial results. Unfortunately, further experience has proved that this nerve is extremely variable in man, and quite frequently recognition of it has been impossible.

The irregularity and inconstancy of this nerve render impracticable what theoretically appears to be the ideal operation, and until anatomical and physiological researches are more advanced we are forced back, at any rate temporarily, to a consideration of the more drastic procedure of cervico-thoracic sympathectomy. In this operation, after retraction of the sterno-mastoid and carotid sheath, Jonnesco exposes the large superior cervical ganglion resting on the deep aponeurosis, and, when its connexions have been divided, turns it down and traces the sympathetic cord to the middle ganglion, which is much smaller and less easily located. The prominent anterior tubercle of the sixth cervical vertebra and the inferior thyroid artery offer useful landmarks for finding the middle ganglion. When this has been freed, the sympathetic cord is followed to the cervico-thoracic ganglion, which is to be discovered between the transverse process of the seventh cervical vertebra and the neck of the first rib, on the inner side of the superior intercostal branch of the subclavian artery. The inaccessible position of the inferior cervical ganglion and the variations in its connexions and extent of fusion with the first dorsal ganglion render this part of the operation extremely difficult.

The publication of cases relieved from the most urgent symptoms of angina pectoris by excision of the cervical sympathetic is likely to tempt many surgeons to consider the operation, and this temptation is likely to be increased by the impression created by some of the advocates of the operation that it is quite a simple procedure. Reference to a dissection of the neck is sufficient to convince most that the later stages of the operation are exceedingly complicated and delicate, and a study of the variations in the distribution and connexions of the cervical sympathetic will at least indicate some of the difficulties to be surmounted in addition to those obtaining in the mode of approach. It is clear from the writings of the pioneers in this important field of surgery that considerable research upon the structure and function of the cervical sympathetic and the nervous pathways to and from the heart and aorta has yet to be completed before a surgical treatment of angina pectoris can be devised which may be practised widely with any degree of certain success. It is to be hoped that the inspiring work already done will not be discredited by impatience. Contributions such as the recent one by Halstead and Christopher help to demonstrate and simplify some of the difficulties of surgical technique, but the anatomist, physiologist, and pathologist have urgent duties to perform towards the solution of the fundamental problems which have been raised by the pioneers in this branch of surgery.

[1] BRITISH MEDICAL JOURNAL, May 10th, 1924, p. 869.
[2] *Journ. Amer. Med. Assoc.*, May 24th, 1924, p. 1661.

THE ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.

THE indifference shown by the public, even by the educated and interested public, on the announcement of the composition of the Royal Commission on National Health Insurance is remarkable and significant. At the time when the profession secured from the late Minister of Health the promise to appoint a Royal Commission to investigate and report on the whole system established under the National Health Insurance Acts a considerable amount of public interest was shown; and not only the medical profession, but politicians and many others concerned with social welfare and local administration welcomed the Minister's action as calculated to ensure an authoritative and judicial inquiry into a subject of great national importance and promise. Later, the terms of reference to the Commission, as settled by the present Minister of Health, were accepted by the medical profession and recognized by organs of public opinion as allowing of the wide and momentous inquiry expected.

There were those who thought, or seemed to think, that the best kind of Royal Commission to conduct such an inquiry was one composed of representatives of the various classes of persons who had been hitherto concerned with National Health Insurance administration or work. This view was combated by the Insurance Acts Committee and the Council of the British Medical Association, and was not accepted by the late Minister of Health. It was definitely understood that the Royal Commission to be appointed should be small, authoritative, and impartial. The need for making these requirements is clear. A large Commission would be most unlikely to result in the unanimity of report and recommendation which is almost essential if, three years hence, there is to be any practical advance on the present state of affairs. Such a report, even if unanimous, would have the impetus of public opinion behind it only if it were recognized by the public from the beginning that those who signed it were men and women whose opinions could be accepted as having undoubted weight and authority, and who had entered upon and pursued their inquiry in an unprejudiced fashion, uninfluenced by previous public utterances or professional pronouncements which they were concerned to defend.

The evident disappointment of the profession and indifference of the public when the actual appointment of the Commission was announced is probably a reflection of the feeling that the present Minister of Health has taken, not a wide, but a narrow view of the essential purpose of the Commission, or that the actual composition of the Commission is such as is not likely to lead to a satisfactory, authoritative, and fairly unanimous conclusion—or perhaps of both these feelings.

We have no wish to speak in the least disparagingly of any member of the Royal Commission. Several are eminently suitable in every respect, and we have no doubt that all are entirely worthy persons who will devote their thoughts and energies whole-heartedly to the work which they have undertaken. It is, however, obvious that certain things may be said, and we think should be said, of the Commission as a body. It is remarkable among Royal Commissions in not containing a single person trained and experienced in cross-examination and skilled in the particular kind of investigation to be undertaken. It contains a number of persons entirely unknown to the general public and even to the public which concerns itself particularly with the matters to be inquired into. It is, of course, quite possible that these individuals may prove to be among the best members of the Commission in the actual investigation, but they clearly detract from the weight which the conclusions of the inquiry will carry in the public estimation. Several of the members of the Commission have been concerned at a recent date in the work of administration under the National Insurance Acts, or have committed themselves emphatically and publicly to particular views on fundamental points connected therewith. There seems, too, to be a disproportionate number of members with a particular bias in the view they take of social questions. There is one member—Sir Alfred Watson—who has, from the beginning, been professionally responsible for the actuarial calculations and financial estimates and dicta on which the whole Health Insurance system is based, and whose opinions, delivered from the position of unparalleled and unchallengeable authority which he occupies in the Government service, have from time to time been the cause of considerable difficulty or controversy. It is possible that all he has said may be right, or at least quite justifiable in the circumstances of the time, but there may have been some occasions on which he was not so happily inspired. It will be one of the tasks of the Commission to pass under review the work and functions of the bodies—central as well as local—which have been concerned in administering the existing scheme, and it is improper that individuals who have been professionally responsible for, or even prominently concerned in, this work should have a place upon the Commission itself. Their presence must almost of necessity create difficulties in the investigation, and to some extent vitiate the conclusions that may ultimately be arrived at. Their proper place should surely be as essential and invaluable witnesses, and not on the judgement seat. Faced with the difficulties of personnel we have enumerated, it will indeed be a personal triumph for the chairman if he should produce any report which will command general consent. We sincerely hope that the disadvantages will be overcome, but they should never have been created.

The real question with which the Royal Commission should be concerned is the relation of a national insurance scheme to the public health. The scheme established by the Act of 1911, and adjusted by succeeding Acts and Regulations, is admittedly tentative, limited, and imperfect; but the Conference of Local Medical and Panel Committees and the Representative Body of the British Medical Association have alike declared "that the measure of success which has attended the experiment of providing medical benefit has been sufficient to justify the profession in uniting to ensure the continuance and improvement of an insurance system." Opinion outside the profession seems also to be almost unanimous in a similar general sense. The relation of any amended or extended insurance system to the other services relating to public health, especially to hospitals and to those clinical services under the auspices of public authorities which have developed largely since 1911, is one of the vital questions which affect national life and professional tradition and activity. Yet we have direct evidence that this fundamental aspect of the matter has never been considered, or even conceived, by the present Minister of Health. It seems not to have been in his mind at all in selecting the members of the Commission. The smaller, even trivial, aspects of the matter, such as possible conflicts of opinion between

officials of approved societies and insurance practitioners, appear to occupy his mind to the exclusion of wider and more important questions. Not only has he failed to grasp a great opportunity, but he appears not to have realized that any such opportunity presented itself. Yet this was obvious to all who were anxious to promote the public health in their several spheres; and many persons, not only in the medical profession, but in approved society and insurance circles, and among members of public health and education authorities, had looked forward to it with the hope of fruitful and important results.

Whatever may be the opinion of some approved societies' officials about some aspects of medical benefit, and whatever may be the opinions of many doctors about approved society administration as presented to them by their patients, it would not be surprising to find a considerable agreement on essential matters between the evidence that will be presented to the Commission by approved societies and that given on behalf of the profession. At any rate, in spite of disappointments, and although minor points will not be overlooked, the evidence which is being prepared for the Commission and will be given by the Insurance Acts Committee and the Association will be concerned primarily with these fundamental and vital questions; and it is still to be hoped that the Commission itself and the general public will realize both their importance and the urgent need for their determination.

TREATMENT OF MENTAL DISORDER.

VARYING opinions have been expressed as to how far it is feasible or useful to devote special wards in general hospitals to mental cases, and we publish this week, at page 551, an important contribution to this problem by Dr. John D. Comrie, in which he gives an analysis of 500 cases of mental disorder treated in the Edinburgh Royal Infirmary. Though these mental wards have been in existence for some years, this fact is probably not generally known, and Dr. Comrie has done a distinct service to psychiatry by giving it prominence. So important a development deserves wide publicity, because the large number of cases admitted in a year indicate that it meets a very real need, and also because the results of their treatment make it abundantly evident that the general hospital has a wide sphere of usefulness in regard to milder or undiagnosed cases of mental disorder.

It is hardly possible to conceive of a more effective method of bridging the gulf which exists between psychiatry and general medicine than that which aims to treat mental cases in a hospital dealing also with surgical and medical cases. Under such conditions the student will obtain an entirely different impression of the psychoses from that gleaned during a few demonstrations in an asylum, though naturally these should be included in his curriculum. In a hospital in which mental diseases are treated the student will meet daily with these conditions side by side with physical diseases, as he will most certainly do as he passes from one house to another in his practice hereafter; he will, moreover, discover that the psychoses demand the same methods of biological examination as he is taught to apply to physical diseases and need similar methods of treatment. It may be that he will learn, too, from his daily study of personality in the subjects of mental disorder that the subject of physical disorder also has a personality as well as a body, and that the attitude of the physician, by encouraging or discouraging hopefulness, may exert an influence on the course of disease. If, however, the student is only acquainted with the psychoses as met with in the mental hospital, especially if (as is the usual practice) he only spends a few hours of his whole medical course in this institution, he must tend to gain an erroneous impression of the psychoses as a whole, and to imagine that these conditions are usually associated with chronicity, deterioration, custody, and legal procedures, losing sight of the fact that many cases are curable and in no sense needing legal detention. We believe also that the association of mental cases with the general hospital will tend to advance our knowledge of the causes of the psychoses and increase our ability to treat them. The services of specialists in all branches of medicine will be available to aid in the investigation of these cases, and it is quite certain that the psychiatrist cannot unaided solve the problems which his patients present.

Already the investigations at the Edinburgh Royal Infirmary have been fruitful and suggestive, and, apart from the paper published this week, we recall to mind the stimulating work of Dr. Chalmers Watson on the part played by auto-intoxication or auto-infection in mental disorders, the results of which were presented in a paper read before the Medico-Psychological Association in July, 1922.[1] It is interesting to observe that Dr. Comrie discovered physical conditions—infective, exhaustive, or reflex—as partial causes in the majority of cases of melancholia, mania, confusional insanity, and psycho-neuroses. This may be due in part to the fact that in a general hospital more emphasis would be given to physical factors, and the opportunities for a complete physical examination by the various specialists would be greater than in the mental hospital; but a survey of his clinical material shows that a type of case was treated which is seldom seen in the asylum. Thus, a large proportion of his confusional cases were post-operative or associated with definite physical disease. The fact that the cases differ in a large measure from those sent to mental hospitals is in itself significant, and thoroughly justifies the use of wards for mental cases in general hospitals. Dr. Comrie observes that many of the patients made a good recovery without incurring the trouble and stigma of certification as insane, but that practically all presented, on admission, considerable difficulty either in diagnosis on in treatment if that had to be conducted outside an institution. Many cases were obviously treated in an early stage of the disorder, and we think it is justifiable to take the view that if they had not been so treated many of them would have drifted into more intractable, and in some cases incurable, forms of insanity. Particularly interesting and important are the patients suffering from simple melancholia, many of whom had made suicidal attempts, which were treated in the hospital. It is noteworthy that these suicidal patients appear to have exhibited demonstrable psychotic symptoms, and it would be interesting to know something of their subsequent history. Many of these cases are uncertifiable, and it is probable that if there were greater facilities for the treatment of early cases, such as is provided by open hospital wards, a large number of suicides, which cause great distress to their families, would be prevented.

We are of the opinion that the general hospital may in the future play an important part in research, teaching, and treatment in respect to the psychoses. But such functions will be limited in their scope until the lunacy laws in this country are amended, and

[1] *Journal of Mental Science*, January, 1923.

it is to be hoped that this very urgent change will soon be carried out. Clinics for uncertified cases will still be necessary, since only the milder types of case, and even those for only a relatively short period, can be treated in general hospitals. It is most desirable, however, that in the future every general hospital should make some provision for the treatment of mental cases, for the reasons which have been suggested in these comments on Dr. Comrie's paper.

PSYCHOLOGICAL TESTS IN EDUCATION.

INTELLIGENCE tests rank among the most remarkable achievements of modern experimental psychology. Their value is being increasingly recognized, though in all probability their possibilities have not yet been fully developed. It is claimed that they afford a more objective, systematic, and trustworthy means of discovering the existence of inborn intelligence and educable capacity in pupils than the ordinary oral and written examinations. Although, so far, no definition of intelligence has found general favour, yet it is agreed that temperament and character are not comprised in it, and that acquired attainments and limited talent available for only one type of intellectual work must be excluded. What these tests of intelligence measure, however, is an inborn and all-round intellectual ability, including both practical and theoretical activities, but excluding processes of emotion and qualities of character. We recently gave a preliminary account (July 26th, p. 157) of the inquiry into these tests conducted by the Board of Education. It is by no means certain that all the tests considered in its published report on *Psychological Tests of Educable Capacity*[1] fall strictly under these headings—for example, the use of the method of "word association" as a test is surely open to the objection that emotional complications are not excluded. Generally speaking, however, it is claimed that these tests render it possible to predict from the examination of a quite young child what will probably be his intellectual level when grown up, since the mental factors so investigated are thought to remain more or less constant throughout life. It is believed that the ratio between the child's mental and chronological ages ("mental ratio" or intelligence quotient) remains unchanged during the years of growth, thus furnishing a guide to the degree of education that is possible, and indicating the form of teaching which will be most fruitful. The nature of the investigations on which the Consultative Committee of the Board of Education based the conclusions contained in the report was described in our previous notice of the volume, which contains an historical sketch of the development of psychological tests, prepared at the request of the Committee by Dr. Cyril Burt. The Binet-Simon scale and its modifications are considered critically and in detail, and standardized tests of scholastic attainment, tests of vocational aptitude, and of temperament and character, receive attention. The various types of psychological tests in connexion with examinations intended primarily to estimate ability are set forth, and the use of these tests in elementary, junior technical, central, and secondary schools is considered. The value of standardized scholastic (educational) tests, physical tests, tests of memory, perception, and attention, and temperamental tests, are discussed in their bearing on educable capacity. Provision of facilities for the instruction of school teachers in experimental psychology is recommended, with special reference to the theory and practice of these tests, and it is considered desirable to take steps to co-ordinate and organize research, and to distribute information bearing on the application of psychological and statistical methods to education. A central committee or clearing house, analogous to the National Physical Laboratory, is advocated to arrange for continuous investigation in various fields over a number of years. The refinement and standardization of these tests can, it is thought, only be effected by the combined effort of a large body of co-operating investigators. Dr. James Drever, Combe Lecturer in Psychology in the University of Edinburgh, suggested that mental testing should be undertaken as a supplement to the medical inspection of school children, and that each educational area should have its own psychological clinic in close connexion with the schools, employment bureaux, and appointments committees. These clinics would also be in touch with the psychological departments of universities and with the National Institute of Industrial Psychology. Details of the tests employed in various countries and the views of several psychologists on the factors involved in "general" ability, and the need for testing for "special" and "group" abilities, are given in appendices. The classified list of recent publications on psychology and psychological tests in Appendix VII, prepared by Dr. Cyril Burt, deserves special mention as providing valuable guidance for those who wish to study these matters further.

[1] London: H.M. Stationery Office. 1924. Price 2s. net.

HOSPITAL ACCOUNTS.

ADMINISTRATORS of hospitals are under a debt to Mr. Joseph E. Stone, the accountant to St. Thomas's Hospital, London, for his book on *Hospital Accounts and Financial Control*.[1] As Sir Arthur Stanley writes in a foreword: "The increasing complexity of modern hospital administration and the necessity of obtaining the utmost value out of every penny of income has brought the subject of hospital accounting and financial control very much to the front during the past few years. It is now generally recognized that accounting is an integral part of hospital administration, and I can vouch from personal experience to the immense value of up-to-date scientific accounting in the administration of a hospital. . . . The book rightly emphasizes the importance of internal financial control, and it outlines methods necessary to be adopted if efficient control is to be exercised at all times and in all departments and activities of the hospital." Sir Basil E. Mayhew, a distinguished chartered accountant, in an introduction, points out that to a large extent the "Revised Uniform System of Accounts" (established for the purposes of the King Edward's Hospital Fund, and valuable in its way), is responsible for the stagnation in hospital accountancy. The system has been supposed to meet all needs, whereas it was based upon the simpler conditions of yesterday. The basis of the system advocated by Mr. Stone is that known as "costing." It is one well known in every large commercial business. The larger and more complex the business the more necessary becomes this system, otherwise leaks that may occur in individual departments may bring the whole structure to the ground. Costing means that for each department there is kept a statement of accounts to which there is debited every expenditure incurred by that department, with its share of the general overhead charges. By that means the profit or loss accruing from that department is known, and the need for the reform or elimination of that department ascertained. Since in hospital working there is no profit to be made it may be objected that such a system is out of place; but the principle holds good for all that, since unless there is this definite knowledge of the separate costs of each department it cannot be ascertained whether each is keeping within the limits set by the total income of the hospital. It may be that one department is

[1] *Hospital Accounts and Financial Control.* By Joseph E. Stone, Incorporated Accountant. London: Sir Isaac Pitman and Sons, Ltd. 1924. (Sup. roy. 8vo, pp. xiv + 146. 21s. net.)

absorbing so much of the vital financial energy of the whole that it acts in effect like a malignant growth upon the body of the patient, whereby so much of the essential vitality is diverted as to bring about death. Mr. Stone has given detailed statements of how this costing system may be carried out, and without unnecessarily cramping the freedom of the members of the organism he shows how it may be adapted to the great hospitals, and how to the smaller cottage hospitals. His claim is a challenge to every hospital administration. It is one that cannot be ignored, and must be taken up and investigated by each hospital, and either approved and adopted or cause shown why the administration declines to do so. It is certain that without some such system as this the board of a hospital is not master in its own house, for without it the board cannot know what is being done in its name. Besides, there is valuable information upon such matters as income tax, but in this Mr. Stone might have been a little more up to date, for he gives no information upon the means whereby tax paid by benefactors may be recovered for the benefit of the hospital.

YOUTH IN MEDICINE.

IT has become a habit since the war to laud the superiority of youth, and to minimize the advantage of judgement, which was formerly supposed to be acquired by the experience of age. In response to this attitude the *Weekly Westminster* is publishing a series of articles on "What the younger generation is doing"; and has followed up disquisitions by Mr. Nigel Playfair on dramatists, and Mr. Humbert Wolfe on poets, by producing (in its issue for September 20th) the views of Dr. Harry Roberts on the younger doctor. Dr. Roberts begins by asking three questions: "Is there, in the medical profession to-day, a spirit differing in essence from that of thirty years ago?" "Do the men who have received their medical diplomas within the last decade differ essentially in outlook or technical equipment from their fathers and uncles who followed the same career?" "Among these younger men, are there any outstanding individuals who, by reason of inspiration or special insight, are in a position to lead their seniors?" Dr. Roberts finds difficulty in answering his own questions, because Medicine is a term which covers a science, a philosophy, and a craft; but he finds little reason to believe that in craftsmanship the best surgeons of to-day are superior to the best surgeons of a century ago. In science Dr. Roberts states that the true inspirers of the new physiology and the new psychology are stout, grey-bearded gentlemen, in no way products of the last decade. As for philosophy, the majority of medical students and doctors neither hunt for nor recognize readily general principles; in fact, philosophy is to them a closed book. The majority varies little from generation to generation: "The average fine old-fashioned doctor and the average smart young medico, with his mouth full of psychoanalysis and endocrinology, are cerebrally indistinguishable." These views must seem depressing to the younger men who won the war which has been attributed by some to the folly of the greybeards. Dr. Roberts, however, has faith in minorities, especially in a minority which he thinks has grown rapidly in the last fifteen years—a minority of "competent and intelligent practitioners who seriously regard their work . . . are ever eager to understand the rationale of their technique . . . and are intelligently critical of traditional postulates and dogmas." These men, he says, now form a much bigger proportion of the whole, and in a very short time he thinks they will no longer be a minority—they are "the heirs of all that revolutionary knowledge which the last twenty years have given us." Dr. Harry Roberts does not seem to us to have answered his three questions, but he ends with the optimistic opinion that, in spite of all the practical limitations and the still long distance from the goal, "the science and art of medicine, as represented by their responsible exponents, stand higher to-day than they have stood for two thousand years." It may be doubted whether any useful purpose is served by attempts to separate into categories the different ages of man, notwithstanding the precedent set by the melancholy Jaques. The procedure is, perhaps, especially dubious when adopted by a medical man, who knows well enough that in the development and decay of the individual human mind no such hard and fast lines can be drawn; while from history it is clear that the present generation can hardly claim to be superior in intelligence to all their forerunners through the ages. Dr. Roberts's article has one merit, in that he appears to recognize to some extent that what is talked about as "progress" is not necessarily progress of the human mind, but often is merely progress in the invention of instruments to help human activities. The main difference between the medical graduate of the last decade and his uncle is probably to be found in his technical equipment.

THE HEALTH BUDGET OF THE LEAGUE OF NATIONS.

ELSEWHERE (p. 582) we give a report from a Geneva correspondent of the speech to the Assembly in which Dr. Caballero commended to the delegates the work of the Health Organization of the League of Nations. What the League has done and proposes to do in the promotion of international health was approved without dissent, but the discussion on Saturday last did not touch the all-important question known as "credits," which has still to be considered, at the moment of writing, by the Assembly. The League of Nations includes a body called the Supervisory Commission, of which all the departments stand in awe. This body is concerned with the finance of the League, and it regards the health activities with a careful and calculating eye. It is disturbed because these activities bulk more largely in each annual budget, and it thinks the time has come to decide on a maximum sum beyond which the Health Section must not go. This sum it has put down as 750,000 Swiss francs, equal at the present rate of exchange to about £32,000, and it is to be left to the officials to distribute the amount as they see fit among the various health activities to which the League is committed. The Supervisory Commission points out, in a semi-apology for the relative smallness of the sum, that the health work of the League is not a temporary measure which, like the work on behalf of refugees, for example, may be expected to diminish in extent, but that it is a permanent commitment, and whatever is voted must be looked upon as an annual charge. The Commission has examined certain proposals which would have had the effect of adding 50 per cent. to the health expenditure, and two of them appeared to be so desirable that in spite of the economical considerations already advanced the Commission felt constrained to recommend them to the Assembly for adoption. One of these is to raise the annual amount spent on sanitary notifications and notifications in the case of epidemics from 10,000 to 15,000 francs. The other is to increase the sum allocated to the interchange of public health personnel in connexion with the system of liaison between the various national public health services from 75,000 francs, at which it has stood hitherto, to 150,000 francs. Other proposals which were made, but which did not commend themselves to the Commission, were an increased allocation for special investigations on health matters, and a new departure in the shape of technical health conferences, on which it was proposed to spend 50,000 francs a year. The Assembly, which will last some days longer, has the deciding voice on these proposals, but it is not likely to cut across its Supervisory Commission.

TUBERCULOSIS IN DOGS AND CATS.

TUBERCULOSIS in the domestic animals is always of interest to the medical man. In the larger mammals and in milk and meat its possibilities are obvious and the necessary precautions can be taken. In the domestic carnivores, however, the danger is more insidious and in some ways more acute. Although in the cat tuberculosis is most commonly of the bovine variety—from its milk diet—the disease in the dog is often contracted from human sources. The dog is by nature a scavenger, and frequently has access to tuberculous expectorates and other infective material. He is often allowed every opportunity of conveying the disease thus acquired to man, and especially children. It was at one time thought that tuberculosis was uncommon in dogs, but modern research has shown that this is far from being the case. Verge has recently given a comprehensive review of this subject.[1] Clinical diagnosis is far from easy: suspicious symptoms are numerous—progressive emaciation, accelerated respirations, dyspnoea, and so on; but the differential diagnosis presents real difficulties. The tuberculin test—so useful in the larger animals—is very uncertain in dogs and cats. The only certain methods of diagnosis are experimental. The demonstration of the bacillus in excreted products is sometimes easy, more often very difficult. Verge points out that experimental inoculation of guinea-pigs and rabbits is the best way; the latter animal is peculiarly adapted for demonstrating tubercle bacilli of canine or feline origin.[2] Deviation of complement has also given good results. While diagnosis is difficult and often unsatisfactory, it is well to recognize the risk which is run from infected domestic animals. Bacilli are excreted in many ways—in the saliva and sputum, in the bile, faeces, and urine, and even by the skin—and such dogs and cats constitute a grave danger, for there is no doubt that animals contracting the disease from man are capable of reinfecting man. This is a source of contagion at least as important as milk and other more obvious methods, if only from its insidiousness and the extreme licence which is given to pet dogs and cats, even in otherwise hygienic homes.

THE PROPHYLAXIS OF DIPHTHERIA.

THE Health Organization of the League of Nations has recently published a document entitled *The Prophylaxis of Diphtheria*,[3] written by Dr. Louis van Boeckel, director of the laboratory of the Belgian Public Health Department. Judging from the list of subjects which have been dealt with previously by this organization, it would seem that its object is to select problems of international importance, to collect information of experience gained in different countries, and to issue short monographs incorporating new knowledge which may be supposed not yet to have found its way into textbooks. The document relating to diphtheria certainly deserves to be called international, as witness the 340 references of the bibliography. English readers will find no novel matter in this monograph: the volume on diphtheria issued recently by the Medical Research Council has even more to say on this subject. We may therefore content ourselves by calling attention to what it contains. Its first part deals with the determination by the Schick test of the susceptibility of individuals to diphtheria, and contains an excellent account of the method for carrying out the test and of what may be expected from it. For readers unfamiliar with the test some illustrations of the different types of reaction would have made the text more easily understandable. The second part is concerned with active artificial antidiphtheria immunization, particularly with the toxin-antitoxin mixture, and gives concise directions for this prophylactic treatment. For the third part the author has wisely chosen the question of the popularization of these new methods. This is a problem still to be faced by all countries. We are watching with great interest the extensive campaign which has been inaugurated by Park and his fellow workers in New York. Park introduced the system of antidiphtherial immunization first of all in the New York schools. The attention of the headmasters was drawn to the value of the method by the Director of Education, and a doctor from the health service furnished the headmaster with full details. An official circular pointing out the dangers of diphtheria, describing the advantages of immunization, and requesting the parents to allow their children's susceptibility to diphtheria to be tested and immunization undertaken, was distributed to one million children attending the schools. It is said that most susceptible school children in New York have now been vaccinated, and that Park's method has been adopted, not only in New York, but also in most of the great centres of the United States. But the Health Organization of the League of Nations does well to remember that methods of propaganda suitable to one country may not be so successful in another. This thought seems to have been in the mind of the author of this report, who concludes in the following words: "However much we may admire the enthusiasm with which the campaign has been initiated and carried on in the United States, we fear that the older continent of Europe may be loth to accept a campaign in favour of antidiphtherial vaccination carried on with the same vigour as that witnessed in America. Let us first of all enlighten the medical profession, and then the public, as to the advantages of the new system of antidiphtherial prophylaxis, and let us apply this system wherever a careful study of the epidemiological situation convinces us that it may be resorted to with advantage."

[1] *Rec. Méd. Vét.*, August, 1924, p. 449.
[2] *Comp. Rend. Soc. Biol.*, 1924, p. 341.
[3] *The Prophylaxis of Diphtheria.* By Dr. Louis van Boeckel. League of Nations Health Organization. 1924. 2s. 6d.

WE have to announce with much regret the sudden death on September 22nd of Dr. Sidney Martin, F.R.S., senior physician to University College Hospital and professor of clinical medicine at University College Hospital Medical School.

THE service of thanksgiving, forming part of the jubilee celebrations of the London (Royal Free Hospital) School of Medicine for Women, will be held at St. Paul's Cathedral at 2.30 p.m. on Saturday, October 25th. On the previous evening a festival dinner will be held in the Guildhall.

SIR ROBERT BLAIR, although he has retired from the post of education officer of the London County Council, still maintains his active interest in education. He is one of the candidates for the chairmanship of Convocation of London University, and he appears to be very strongly supported. His election would bring to Convocation and the University a wealth of educational knowledge and experience; and from the valuable support he gave to the medical staff in the service of the London schools it may be assumed that he would serve well the interests of medical education and medical graduates.

THE nomination of candidates for the parliamentary by-election for the University of London has been fixed for Wednesday, October 1st, at 11 a.m. at the University, and polling will take place from Monday, October 13th, to Friday, October 17th. The voting is by voting paper sent to all graduates on the parliamentary register by the Vice-Chancellor.

MOTOR NOTES FOR MEDICAL MEN.

By H. MASSAC BUIST.

Eve of the Motor Shows.

The yearly International Paris Automobile Salon opens in the Grand Palais, off the Avenue Champs Elysées, on Thursday next, October 2nd. Apart from members of the French industry, there will be an aggregate of thirty foreign exhibitors, of whom four only are of British origin—namely, Austin, Morgan, Morris, and Rolls-Royce, the actual Morgan exhibited being a machine built abroad under licence from the British originators.

The eighteenth Annual International Motor Car Show promoted by the Society of Motor Manufacturers and Traders at Olympia will open under the patronage of the King on October 17th. The public will have access to it daily, Sunday excluded, until the 25th. By contrast with the Paris Exhibition, the London one will retain the distinction of being beyond challenge the most thoroughly representative of the world's motor car manufacturing industry, nothing approximating to such an absolutely representative international character being organized elsewhere. Thus there will be no fewer than 128 exhibitors of cars, 25 exhibitors of tyres, and 284 exhibitors of accessories and components, apart from which no fewer than 57 carriage builders have been allotted space in the enlarged building. By reason of our Free Trade policy, which is singular among the nations possessing motor car building industries, this country is the motor mart of the world, America, with her high tariff wall, having aimed always at keeping out foreign products. In effect, the best examples of motor car design and manufacture in the world are on our market and will be represented at Olympia, together with several examples of the undesirable. Therefore, no medical man need consider it necessary for him to journey to Paris next week in order to inform himself concerning the new style motor cars introduced for the 1925 season.

Notable Developments of the Year.

While it is still possible to add accessory to accessory in the equipment of a car, there is no gainsaying that some standardized machines have become overloaded, though under this head the owner will necessarily follow his own inclination. It is impossible to offer any useful expert advice beyond suggesting that every user should put to himself the question: "Is it essential that I should have this gadget, or that; and, if I must have one, or both, what, if any, power will they absorb in the way of current from the batteries, and so forth?" Electric screen wipers, cigar lighters, signal-horns, and so forth are very convenient; but how many owners are aware that a signal-horn, for example, uses more current in ordinary car service than is absorbed from the battery when starting the engine? Perchance under this head the average medical practitioner's use would be different from that of the ordinary member of the public in that, generally, the family doctor has to make short journeys, on commencing each of which he has to start his engine by mechanical means. But in adding an electrical accessory to a car one should always have in mind the current it will necessarily use and especially the need for inspecting the wiring at frequent intervals in that the slightest leak may lead to a costly bill on account of repairing or replacing the battery.

Much experiment has been devoted this year to continuing the investigation of four notable problems—the application of brakes to front wheels; the furtherance of fabric bodies of light weight; the standardization of low pressure, large section pneumatic tyres; and the possibilities of forced induction, generally called supercharging, with a view to obtaining more power from an engine, primarily for aircraft service, to enable the "ceiling" to be raised. The last-named development does not concern the medical man at the moment beyond his noting that, in the case of the first British engineering house to give attention to the use of supercharging mechanism experimentally, a very important stage of progress has been arrived at which may render it possible presently for the supercharger to be of service to the user of a standard car. Briefly, last year foreigners used supercharging for the French series of Grand Prix races, and other first-class tests of the kind, employing gear that is not only complicated, expensive, and extremely unreliable, but which is also required to run in some cases at 20,000 revolutions a minute. In short, this is scarcely commercial practice.

Last Saturday's Supercharging Demonstration.

But in engaging in this year's Grand Prix race Sunbeam has experimented with a supercharger wherein a Rootes type of blower is used which is run no faster than crankshaft speed. The results obtained not only enabled this manufacturer to achieve the fastest circuit, but also the fastest speed over the measured course, each by two different Sunbeam machines, in the course of the first International 500 miles Grand Prix of Europe road race. The accessory, besides, adds 33 per cent. to the power output of the engine when it is running at high crankshaft revolutions, and it adds no less than 50 per cent. at lower crankshaft revolutions. Moreover, no trouble was experienced by the firm with this sort of supercharger in that race; nor when Mr. Louis Coatalen, the chief engineer, applied it to the small 1,500 c.cm. 4-cylinder engined Darracqs run in the Junior Car Club's 200 miles race on the track at Weybridge on Saturday last, wherein that make broke world's records, the three machines covering the distances at over 102 miles an hour mean speed, each with power plant that would be rated at 10 to 12 horse-power for Treasury taxation purposes. In this connexion it is interesting to note that the weight of the blower used on these engines was 35 lb. only. Thus we have arrived at the point at which it is possible to apply a supercharger to an engine (1) of a weight that is commercially practicable; (2) which functions at a normal speed because it does not turn any faster than the crankshaft of an engine; (3) which can be designed to increase the horse-power developed by an engine to a greater extent when the crankshaft is running slowly than when it is running fast; and (4) the cost of which is practicable commercially. Being interpreted, this means that a given power plant so equipped is able to get a car away, either from a stand or from a traffic slow-down, with unprecedented efficiency. If we are to deal with the long-standing problem of the gearbox, and to enjoy a chance of eliminating it, plainly we must increase enormously the flexibility of the engine. In particular, it must be possible for it to develop very much more power when the crankshaft is turning slowly. This is what this form of supercharger renders possible. At the moment, however, the matter is to be regarded as still in the experimental stages merely. We must not expect the gearbox to be eliminated right away by this means, though there will be early and immature attempts in this direction almost assuredly in face of the Sunbeam and Darracq successes. An automobile engineering house of such repute, however, would not proceed in this direction until it had years of further experience of the problem.

Balloon Tyres in Service.

The fabric-covered body is a development which was described in these columns in detail last year. It has been taken up since by a large number of manufacturers here as on the Continent, and some American car builders are also standardizing the scheme, though none of these particular examples is likely to be placed on the British market this year. In any case, the only point to mention in this connexion on the present occasion is that a large number of chassis builders will be showing such bodies manufactured under licence, and designed specially for their particular vehicles, at the forthcoming Olympia show.

There, too, it will be found that a number of car builders in this country, as on the Continent and in America, are standardizing what are variously styled "low pressure," "balloon," or "comfort" tyres. Necessarily the medical man is interested in this matter, since anything that makes for enhanced comfort of riding is of importance to him as saving fatigue, and, notably, giving his hands the best opportunity for being in a sensitive, as distinct from a numbed, condition, in which latter state they are apt to get

as a result of driving cars that are coarse. It would be correct to state that millions of words have been written and printed for and against so-called "balloon" tyres. Practically all that has appeared is concerned with what the various writers believe to be the theory of the proposition. In point of fact the medical man need not bother about such theories because balloon tyres exist to-day as practical appliances, in defiance of many theories on which the pneumatic tyre industry has been working for thirty years past. Alike manufacturers and users of balloon tyres are at the present moment divided into two schools at least, each advocating a different principle of construction. Many of the things which, we are told by theorists, concern the conduct of chassis so equipped do not in fact occur in practice, or, if they do, it is found that the given characteristics are manifest to a degree that is negligible. At the moment one has to record the mere fact that, while a number of car models are standardized with low pressure tyres of large section, nevertheless the automobile engineers of the world accept the proposition with many reserves.

Characteristics for the Road.

As to the practical application of the principle as concerns European manufacturers to date, it is observable that builders of small cars have standardized comfort tyres for 1925, notably Morris, Rover, Citroën, Renault, and such like, with a number of others. The comfort tyre is by no means so much in evidence, however, in connexion with middle-size and large cars, though there are exceptions. One of the most popular engine sizes for 1925 cars is 3 litres, or 183 cubic inches, which in the best European practice is really a big car class now, whereas in American practice it still represents merely the middle-size car because transatlantic engines do not develop as much power as European ones. But the weights of the vehicles are much about the same, and this class of chassis generally represents a full scale four- to five-seat car. I have made a point of driving both a British car of world-wide repute and the very latest American six-cylinder car coming within this category, both equipped with comfort tyres—the English one of the wired-on type and the American one of the straight-sided sort. With the English car, which has absolutely true pivotal steering, a remarkably good suspension system, and so forth, the tyre pressure was about 45 lb. to the square inch; whereas for this type of machine with its speed capabilities the rear wheels would be pumped to at least 70 lb., and the front ones to 65 lb., with ordinary tyres. With the comfort tyre I found the steering so light as to be absolutely unaffected. But there is no gainsaying that, in taking corners or bends at speeds well within the compass of the car, it lurched to a degree that was inconvenient to the passengers. As far as the American car was concerned it was quite as heavy a vehicle; yet the manufacturers of the straight-sided tyre recommended 28 lb. pressure only for the front wheels and 32 lb. for the back wheels. Of course, the American springing system was not equal to that of the British machine because the American car is a type of vehicle designed for service all over the world, therefore it has to be capable of withstanding more severe shocks. In the matter of steering, sometimes it answered easily and at other times it wanted the use of both hands to make a right-angle turn. One had to employ a deal of physical effort on a gradient which describes a half-circle, and which I use for discovering how the gear ratios of different cars work out in practice; therefore I never approach it on any machine as fast as twenty miles an hour. In this particular case I approached at eighteen miles an hour and found that the American engine and gear ratio enabled this machine to continue easily up the rise, accelerating on top gear, although I did not ever let the car exceed twenty-seven miles an hour.

Dragging on Curves and Corners.

But in negotiating the given curve with the engine behaving so easily I not only needed great physical effort to steer the car round, I also alarmed the company's mechanic because the back wheels dragged loudly. Afterwards we examined them and found that during the negotiation of the curve in question we must have been riding on the upper half of the tyres—that is, on the side, as distinct from the tread proper. Apparently the tyres on the front wheels were not deflected to a like degree. Yet throughout the speed was well within the compass of similar motoring with ordinary tyres. With them on such a chassis one could have taken that hill with safety at thirty-five miles an hour. In the case of all the big cars that I have tried this year—and I have tested most of the leading designs—I have found that luxurious suspension is obtained without the use of comfort tyres. But most of the small cars I have tried during the twelvemonth could be made to ride better.

In this connexion the use of the low pressure tyre is certainly interesting and is to be recommended as a cheap solution if the problem is understood properly. For one thing, most medical men will appreciate that when the first of the post-war series of small cars was put on the market, whenever a manufacturer or agent wanted to demonstrate he arrived with the ordinary tyres then fitted inflated to low pressures only; of course, this enabled his machine to ride better and therefore to give a more favourable impression. But, as was pointed out in these columns at the time, the practice is fundamentally wrong, is unsafe, and is uneconomical of tyres. By contrast the properly designed low pressure tyre is intended to be run at the pressures

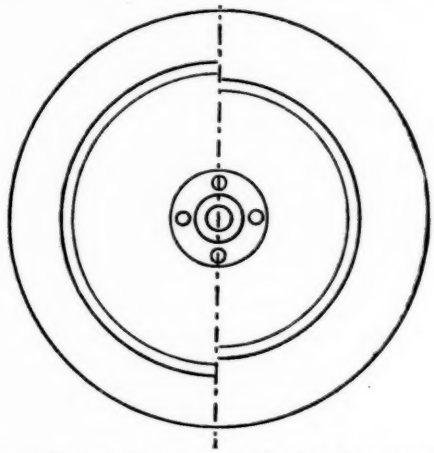

FIG. 1.—Illustrating (left) ordinary tyre, and (right) "balloon" tyre.

indicated by the tyre maker for the given weight, and is not being used under the wrong conditions at those relatively low pressures which, however, would be entirely wrong if applied to an ordinary tyre. For one thing, the low pressure tyre must have a wheel rim designed especially for it, because low pressure tyres cannot be effectively fitted to ordinary tyre rims. That would upset entirely the gear ratios and, even if one succeeded in fitting such a tyre in such a fashion, one would find it constantly tending to peel off the rim, which is a source of danger. Therefore all systems of low pressure tyres at present on the market are designed to require a width of wheel rim proportionate to their air-retaining section. In other words, balloon tyres are not oversized tyres placed on ordinary rims: neither are they pneumatic tyres made out of proportion. On the contrary, they are designed and made to be entirely in proportion; therefore, for a given car the circumference of a balloon tyre that should be fitted is exactly the same as the circumference of an ordinary section tyre; but in the case of the comfort tyre a wheel rim is required proportionately smaller in diameter but of greater width than the rim needed for an ordinary tyre (see Fig. 1).

Contact Area and Speed.

A very considerable amount of quite unnecessary confusion is being occasioned in the minds of inquiring car users by the implication that the comfort tyre must take a good deal off the speed of a car and must interfere with the steering because it must be flat by reason of the low pressure. In point of fact the alleged flatness is not

discernible to the eye in practice in the case of a comfort tyre inflated as it should be; despite the fact that users of comfort tyres are to be seen driving about the country with these proportionately gigantic pneumatics looking flabby and presenting quite a flat contact on the road. That, however, is a condition for which the user is alone responsible; it has nothing to do with the right application of the principle as such, nor do the tyre makers recommend it. Sundry examples of the right way to use comfort tyres are available all over the country to-day, merely by observing how small cars of the types mentioned above are presented on the road. In these proportionately much larger tyres on such little cars one does not notice that there is any "flatness" where the tyre makes contact with the road. Of course, a much better road grip is obtained by the use of a comfort tyre, whether of the beaded-edge, the wired-on, or of the straight-sided types, than with ordinary size pneumatics, this being one of the great claims advanced on behalf of the new type. Properly to appreciate the matter, however, it should be noted that there is not great *length* of contact with the road on the part of the comfort tyre by comparison with an ordinary one; rather is it a case of a

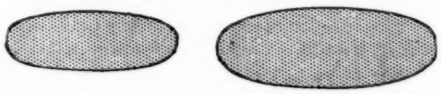

FIG. 2.—Illustrating relative areas of tyre tread contact with the road in the case of a given car fitted with ordinary size pneumatic tyres (the smaller area) and with a low pressure tyre (the larger area). The depth of section represents the direction of travel and the width of section represents the width of grip on the road.

greater proportionate area of road grip being obtained (see Fig. 2). That makes for safety and efficiency as regards enabling a car to hold the road in circumstances in which, otherwise, it might tend to slip sideways, forwards, or backwards; while the lower pressure gives the suspension system less work to do, so that the car can ride over obstructions, such as stones or bricks, without bouncing off them into the air. In other words, with the comfort tyre it is possible, for a given system of suspension, weight, and car speed, to maintain continuous contact with the road in a vast variety of circumstances in which an ordinary car would lose contact with the surface, and therefore lose driving efficiency, waste petrol, and sustain scraped tyre surface each time the driven wheel came back on to the ground. But the larger area of contact achieved by the use of the comfort tyre, being particularly appreciable in regard to the width of the road grip (see Fig. 2), dictates

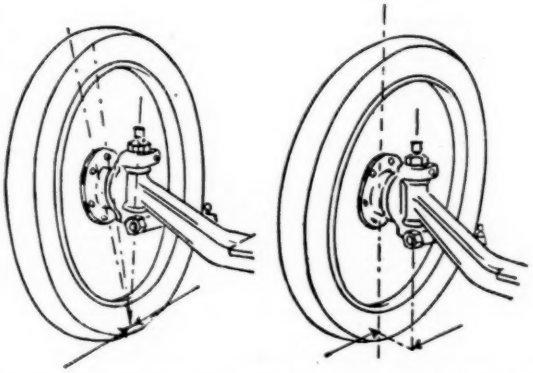

FIG. 3.—Illustrating (left) true centre point steering, and (right) non-pivotal steering.

that the steering must be designed on true centre-point principles unless the driver is to exercise much effort, which is undesirable not only as far as he is concerned, but also because it means that the tyre tread is being scraped whenever the course of the car is being deflected: that makes for wear (Fig. 3).

"Bogie" Points Banished by Practice.

Some imagine that the use of comfort tyres must necessarily take something off the speed of the car. They would have a very strong argument if medical men had to drive their cars at speeds at which experimental machines are designed to run for records (such as the Darracq performance which set up a fresh standard last week) by which to judge car engine efficiency. But at the speeds at which the medical man requires to drive his car the difference between the use of comfort and of the ordinary section pneumatic tyre is negligible. It is not easy to define the matter more closely than that, for this reason among others: road surfaces differ all over the country. If you drive on those of the billiard-table variety, under the heading of mere maximum speed attainable you would achieve better results with an ordinary tyre inflated to its higher pressure than you would with a comfort tyre, which should be inflated to a lower pressure. But if you chance to go over a road of bad surface, then at such speeds as an ordinary car is capable of you would rather stand to gain than to lose by using a "comfort" tyre, because the "balloon" tyre would itself absorb by its air cushioning action a vast number of the bumps which are occasioned by passing over the irregularities of the road surface. Therefore the driving wheels would maintain practically continuous contact with the road surface, and the horse-power developed by the engine would not be wasted, as it is the moment a harder inflated, smaller section, ordinary pneumatic tyre receives a jar from an irregularity of the road surface, or from a loose stone, and therefore starts to bump off the road surface into the air, where the power of the engine is spun away instead of being harnessed to useful driving effort.

In regard to acceleration, as when starting a car on its journey, the momentary casting of an additional load on the back wheels would have no adverse effect by making a low-pressure tyre present a larger area of surface in contact with the road than does a higher pressure, smaller section tyre. We should be mindful not to be governed by theory, but rather by practice, for (as has been observed above) the low-pressure tyre is a practical proposition to the extent achieved to-day solely and wholly in defiance of principles on which the pneumatic tyre industry has been working all these years.

In the matter of cost, there is no reason why bills should be heavier with the use of low-pressure than with high-pressure tyres. It is too early to determine whether, in the hands of the ordinary motorist, one actually saves money on the tyre bill by using low-pressure tyres. There is one reason that offers a material prospect of gain by using balloon tyres. The whole fabric, being under lower pressure, is stressed to a vastly less extent, which is very important as regards the strain on the cover, which has to be kept inflated not merely when the car is in use during actual travelling along the road, but also all the time it stands in the garage, year in, year out. There is, besides, one certain economy of wear and tear to be achieved by the use of "comfort" tyres fitted properly and maintained at the correct pressures in the case of cars possessed of true centre-point steering: the shackle bolts of the springs, and the springs themselves, are saved wear to a quite extraordinary degree because they are protected by the low-pressure, large section pneumatic from a much greater proportion of jars received when traversing irregularities of road surfaces; and those received are cushioned to a remarkable extent.

Some Car Builders' Criticisms.

The fact that a large number of motor car manufacturers believe in the use of balloon tyres does not mean necessarily that, in the present stage of development, that type has definitely superseded the ordinary section pneumatic. On the contrary, of the builders who have standardized "balloon" tyres, a goodly proportion provide relatively defective springing and use the "comfort" tyre to disguise that. Formerly small car manufacturers, in particular, were wont to demonstrate their machines with ordinary section tyres inflated at pressures below those recommended by the tyre manufacturers.

The difficulties experienced in connexion with the use of "balloon" tyres of various sorts include (*a*) the failure of the side walls, which, however, constitutes a problem that has been largely solved through the proportionately

wide rim base required by all makers who have standardized this type of tyre for the current year, as indicated above; (*b*) side roll occasioned by the use of such tyres, which, as I have shown, has not been overcome yet in the case of larger constructions; (*c*) harder steering, to which the same remark applies; and (*d*) greater noise. As to the last point, one is aware to-day that, where motorists use steel-studded, non-skid ordinary section tyres, the passage of a car creates much greater noise than when the all-rubber treaded tyre of good gripping, anti-skid section is used. I have, however, often observed that the use of the balloon type of tyre on middle size and on large cars does create noise to a degree that is noticeable when taking corners, or curves, in circumstances in which, with ordinary section tyres on the same types of cars, the passage of the tyre would be quite undetected by the human ear.

In general, at this stage one's advice to medical men is that, if a manufacturer standardizes his car in any of the smaller categories with "balloon" tyres, it is advisable to run such a vehicle in that condition once one is satisfied that lightness of steering is not prejudiced. As regards fitting cars already owned with balloon tyres, one must have in mind the cost involved in fitting different wheels from those standardized for the use of tyres of normal section. Therefore, in most cases, it is scarcely worth doing.

There remains the case of the medical man who, because he is a specialist, or has a country practice covering a very large area, needs a really efficient middle size, or an actual big, car because he requires to put it to good speed performance on occasion. At the moment, one would suggest that it were better to allow manufacturers to go ahead gaining experience with the use of balloon tyres for these constructions than that the medical man should himself make the experiment. For one thing, these more powerful, larger scale cars are usually designed with very excellent springing systems; therefore, with the use of ordinary tyres of ordinary section and ordinary pressures, there arises no question of rough riding. Unquestionably, much experience will be obtained with balloon tyres during the next twelve months, alike by the tyre industry, by motor car manufacturers, and by the public. Doubtless the average medical man will conclude that the first two can more usefully conduct this work than himself.

Dunlop's Distinctive Policy.

Such a firm as the Dunlop Rubber Company holds that the whole proposition of the "balloon" tyre has been rushed in America. Be that as may be, in the issue it has decided to employ a different rim and tube section from those favoured by most manufacturers. With its thirty years' experience of both beaded-edge and wired-on types of tyres, its technical staff were of quite an open mind and discussed with manufacturers their technical requirements, the final decision being that a tyre designed to be run at relatively low pressures should be independent of the inflation pressure for its retention on the rim. This theory was tested exhaustively, and it proved completely sound in practice; hence the Dunlop balloon tyre is a wired-on type, and, unlike beaded-edge tyres, which are essentially inflation held, it is retained on the rim by its inextensible wire edges being smaller in circumference than the lips of the given rim. In this respect this Dunlop type tyre is identical with the straight-sided type of tyre, the adoption of which in this country has been delayed chiefly because of its higher initial cost, albeit the straight-sided type is widely favoured in America. In balloon tyre practice this difficulty of initial cost can be obviated, and a tyre constructed on straight-sided principles and offered for the first time at a price no higher than that of the beaded-edge tyre of the same nominal size and capacity. Incidentally, the Dunlop balloon tyre is used in conjunction with a rim made in a single piece in which the necessary strength can be provided by a relatively much lighter construction; this achieves a simple means of fitting and detaching the tyre, and allows the valve to come through the side of the rim. Of balloon tyres in general it should be observed that the use of the corded type of cover construction, being by far the stronger, is general, and, of course, is to be recommended. Satisfactory service can be looked for only by maintaining balloon tyres at the pressures the manufacturers recommend for the given size pneumatic.

Front Wheel Brakes.

Of front wheel brakes it may be recorded that there is a vast increase in the number of manufacturers who will be standardizing this accessory, particularly in regard to middle-sized cars—for instance, Austin, Rover, and Star. No one system of construction is accepted universally. Front wheel brakes have been evolved to the practical point, but are still merely in the earlier stages of development. There is as much difference between the merits of systems used as there is between the power developed by the engines of the different cars on the market. I regret that I can form no other opinion than that the majority of front wheel braking schemes are being supplied to-day solely to meet pleadings of the salesmen who realize that the public has been educated to demand such accessories. Thoroughly sound and safe front wheel braking schemes are employed in the minority of cases only. When a really safe system is fitted an absolutely new standard of motoring safety is achieved by the introduction of front wheel brakes. But when a braking system is not satisfactory, at least to the extent to which it is possible to make one in the light of knowledge acquired to date, then it is safer not to have front wheel brakes. If any reader doubts this, let him have in mind the fact that in America insurance rates on cars fitted with front wheel brakes have been put up.

Apart from one's instinctive objection to doing so in connexion with a development which is really only in the initial stages, it must be said that the whole problem is vastly too intricate at the moment to lay down any hard and fast rules. Suffice it for illustration's sake that the front wheel braking system of the expanding shoe type, wherein six sets of brakes are applicable to a given car, as in Sunbeam practice, provides an absolutely new standard of safety in regard to motoring; whereas in regard to certain other cars that shall be nameless, front wheel brakes are designed of smaller diameter than the rear wheel sets, are fitted at lower shoe pressure where shoes are used—say, 7½ lb. front to 30 or 40 lb. behind—and the front wheel brakes come into operation at an appreciable interval of time after the brakes on the rear wheels. By these and other signs they may be recognized as brakes made by firms who realize just enough to be aware of the fact that they do not understand the subject, therefore they wish to take no chances. Of course, so little power could be absorbed by a front wheel brake built on the scheme just mentioned that practically no embarrassment would be caused to the freedom of the steering, or what not, if anything did go wrong with the system; in short, this school of motor constructors simply mesmerizes the car owner into the belief that he has an effective front wheel brake.

Some Helpful Points.

Again, there are systems of brakes by contracting bands, instead of by expanding shoes, which when operating successfully furnish to the given car more efficient brakes than those particular vehicle types have had hitherto; albeit the degree of efficiency in question is, at the most, no more than the efficiency achieved in a car with ordinarily efficient expanding shoe back wheel brakes and none on the front wheels at all. When it is wet, the unprotected exterior band type of front wheel brake is undesirable because dirt, grit, and so forth can get into it and, sometimes, the lining becomes saturated. Thus when one applies such brakes in rain one discovers that one slides a hundred yards, or more, while yellow grease is being squeezed out of the linings, and that after that they "bite" suddenly. In the circumstances it is difficult to lay down hard and fast rules; but serviceable points to have in mind include the following:

(*a*) If a manufacturer offers front wheel brakes at option, buy his car without such brakes; evidently he himself has not sufficient faith in them to put his whole reputation behind them.

(*b*) Where a car builder fits front wheel brakes observe whether he has redesigned his front axle to take the twisting strain involved by their application, for, whereas the I-section front axle is the best possible for achieving lightness in combination with sufficient strength for one that has to deal solely with a rolling wheel, nevertheless it is about the worst section possible to resist the twisting strain of brake application; hence such constructors as Fiat, Sunbeam, Lanchester, Daimler, Rover, and so forth use either solid circular or tubular section front axles, the only point that is material in this connexion being that such sections should be available from the spring pads outwards to the wheels, in that it does not matter what section the axle takes between the two springs.

(*c*) Test whether the steering is affected in any way by the use of front wheel brakes: uphill, downhill, on the flat, on the camber, at fast speeds, legal limit, and traffic crawls.

(*d*) Do not be bluffed into the belief that, merely because a car has brakes to all four wheels, it is necessarily more efficient in that connexion than one that has them to the two rear wheels only, because the former may have small diameter, or low pressure, or narrow section, or otherwise inefficient brakes on all four wheels; whereas the latter may have wide, deep diameter really effective brakes to the back wheels only and be, in fact, much more efficiently braked.

(*e*) Remember that the fitting of front wheel brakes adds to the weight and complication of the car's mechanism.

No Universally Adopted System Yet.

My own opinion is that front wheel brakes will be universal practice in a few years. But it is nineteen years since I had my first experience of front wheel brakes, and I realized then, by exciting "incidents" experienced on greasy surfaces, how much one has to learn before a front wheel brake can be fitted which will prove safe in all circumstances of use. That is the problem. It is doubtful if the average owner could adjust satisfactorily most front wheel brake schemes. That is not so easy as it looks even though the wing nuts be accessible—as, in some cases, beside the very wheel hubs themselves. One adjustment for all four brakes is, of course, the best, as in Lanchester, Rover, and Sunbeam practice. Schemes vary vastly in merit, as do methods of control. The entirely mechanically controlled Lanchester method is a splendidly sound arrangement. Again, the compensating scheme adopted by Vauxhall is as excellently effective as it is simple. Servo mechanism, which some firms do not fit, is nevertheless a great gain in regard to assisting lightness of control and ensuring safety. Some firms, such as Sunbeam and Rover, use Servo control for the front wheel brakes only and not for the rear set, which, incidentally, is one means by which they conform with the now twenty-year-old law that requires that a car should be capable of being held on either of two independent sets of brakes operating on the rear wheels when the vehicle is at a stand on a hill. Where Servo mechanism is applied to all four wheels, when the car comes to a stand that system of brakes will not hold it. Hence the application of Servo mechanism to the front wheel brakes only by certain manufacturers and designers.

ROVER'S NEW PROGRAMME FOR MEDICAL MEN.

Than the Rover Company, no British enterprise has succeeded in providing lower-priced, more durable, refined, economical running cars that have proved uncommonly dependable and satisfactory over a period of years. In one district in the provinces no fewer than eighty-five medical men own the 12-h.p. type of machine who cannot be induced to buy anything of later design because they are so satisfied with the performance. The Rover Company, however, is making a radical change in its programme of car design and production for the 1925 season which, tests, convince me, will be successful in causing the at present contented medical man who can afford it to become dissatisfied with what Rover he has and acquire one of these new style models. Briefly, the firm will supersede the well known 12-h.p.—lately re-rated at 14-h.p.—side-valve engined three-speed car by a four-cylinder overhead valve four-speed nominal 14/45-h.p. car of approximately the same engine capacity (2,132 c.cm.), but of extraordinarily different performance, the whole power plant and chassis being the design of Mr. P. A. Poppe, who has been working on it with the Rover Company since Christmas last. But he had actually this type of chassis in mind from the time of the armistice. He designed and built the original power plant and gear sets for Morris-Oxford cars, and is a remarkable mathematician. The present aim is to produce a Rover car which itself should be, if anything, ahead of its time. This machine, which will be introduced to the public at Olympia on October 17th, will be listed at little more than the price of this year's 14-h.p. side-valve engined car, and will scarcely scale more than one hundredweight extra, including the weight of the balloon tyres standardized. It is a very much more ambitious car, alike as to performance and accommodation, than the type it supersedes, the tax being nevertheless only £14 a year. Though the overhead valves are on opposite sides of the cylinders, only one overhead camshaft is employed. Moreover, it is set on one side of the engine, being driven by a vertical shaft from the crankshaft. A truly hemispherical combustion chamber is achieved, and the sparking plugs are set vertically in the top of each cylinder, in the dead centre—the most efficient position. Pressure lubrication is furnished to every engine bearing. The lubrication design marks an innovation in, among other things, the quantity of oil carried in the sump—about three gallons—which is schemed specially to cool it. The lubricant is circulated by a gear pump at the foot of the vertical shaft which drives the overhead camshaft. The oil is forced (*a*) up the vertical shaft into the inlet rocker chamber, across the head into the exhaust rocker chamber, thence back into the sump by way of the steering box; and (*b*) along passages in the crankshaft and crankcase to each big end bearing, to each of the three mainshaft bearings, and, from the big ends, upwards through the hollow connecting rods to the gudgeon pin bearings, whence a spray is directed on to the inner side of the piston crown. The clutch and gearbox also receive their supply of lubricant from the engine sump, a constant level being maintained in the gearbox. Any overflow finds its way into the clutch chamber, where it is picked up by the flywheel and discharged through passages back into the crankcase. Should water get into the lubrication system by any chance it is rejected by special filters, and falls to a trap below. It will be observed that the steering box, which in ordinary cars is generally neglected, is in this case lubricated positively and automatically. Four speeds are provided, and an extraordinary degree of quiet running is achieved by the introduction of gearwheels with tooth profiles of a form unlike any I know, a consequence being that one does not hesitate to change speed, so quiet is the running on the indirect drives. It is possible for a driver familiar with this car to change gear without withdrawing the clutch—a point mentioned to show the extraordinary ease with which the gears can be changed by one who can judge his engine speed accurately.

Notable Points of Original Practice.

The unit construction of engine and gearbox has been achieved without the disadvantage of inaccessibility ordinarily involved. A more accessible chassis I have not seen yet. The controls are on the right hand. An uncommon feature is that the gear lever itself is adjustable for position, while the hand brake lever design breaks fresh ground. The strength of the frame, without involving heaviness, is quite beyond the common. Four wheel brakes of no less than 13 in. shoe diameter, enclosed completely, are furnished on the Perrot patent principle as regards the control of the front sets. Exceptional features of Mr. Poppe's design of the braking installation include the means of lubricating the cross-shafts; and the manner of allowing for the difference of axle and spring position when the front wheel brakes are in active operation, equal braking efficiency being transmitted to each of the four wheel brakes during that period only. Again, the hand-controlled brakes operate on all four wheels in synchronism, as do the foot-controlled brakes. Yet both sets are entirely separate, and each set is so designed that, if the front wheel brakes were to fail, the back ones would hold. In effect, there are four completely efficient sets of brakes, so that three sets could fail and still the driver would have efficient braking on two wheels of the chassis. This interesting device will be one of the notable new things to be studied at the Show. The steering gear is adjustable in every direction. The steering joint, and the front wheel

brakes control gear joints, are mud- and grit-proof without leather covers. The propeller shaft is enclosed, the drive being taken by a clutch consisting of a bronze disc between two steel plates, through the gearbox to a propeller shaft enclosed in a torque tube that has a bearing for the shaft about midway—thus eliminating drumming, which would occur through shaft whip when this length is unsupported—to the back axle driven by silent spiral bevel gear. The car does a petrol consumption of about twenty-five miles per gallon at touring speeds; has a wheelbase of 10 feet; a track of 4 feet 6 inches; a ground clearance of 8 inches; and a speed of over a mile a minute, the engine being an uncommonly efficient one, designed for a mean effective pressure of no less than 105 lb. per square inch at 2,000 crankshaft revolutions a minute, and capable of acceleration up to 4,000 crankshaft revolutions a minute. Therefore, though rated at 14/45 h.p., this power plant gives very much more power than the higher figure. Yet it can be run for the cost of the now superseded 14-h.p. Rover car. It will be available alike with Weymann and with coach-built bodies.

For the medical man the Rover Company will also introduce at Olympia the new 9/20-h.p. 1,074 c.cm. overhead valve water-cooled four-cylinder engined £9 tax type, which is available with two-seat body and with four-seat "chummy" body, also with a three-door body in a *de luxe* edition, all with Dunlop balloon tyres, the petrol consumption varying between forty and fifty miles per gallon. The speed possibilities are in excess of fifty miles an hour—I obtained fifty-three miles an hour in test—and the equipment includes an all-weather hood, and so forth, this being a machine that will be marketed at less than £200 in the ordinary version, and at very little more in the *de luxe* version, which latter has 5 inches longer wheelbase. Rover is one of the notable 1925 recruits to the overhead valve system. These two chassis types, together with the continuation of the 8-h.p. air-cooled two-cylinder engined machine that sells at £160, complete the firm's manufacturing programme for the 1924-25 season.

GLASGOW MEMORIAL TO LORD LISTER.

UNVEILING CEREMONY.

So far back as February, 1912, an influential committee was appointed in Glasgow to promote the establishment of a memorial to the immortal memory of Lord Lister. Owing to the war the activities of this committee were for a time suspended. Later, following various suggestions as to the most suitable form such a memorial might take, it was resolved to erect a statue in bronze to be placed in the Kelvingrove Park. A suitable site was obtained near the statue of Lord Kelvin, his illustrious contemporary and colleague in the Senate of Glasgow University. To Mr. G. H. Paulin, A.R.S.A., was entrusted the preparation of the statue, which is a striking figure in bronze and is mounted on a granite base. Lister is represented seated, with head uncovered, and wearing his academic robes. The sculptor has depicted him in a strikingly alert attitude and as he was while still in the full vigour of his professional career.

The unveiling ceremony took place on September 17th, in the presence of a large and distinguished company. The Lord Provost, Mr. Matthew W. Montgomery, presided and called upon Sir Hector C. Cameron, a former dresser, house-surgeon, and assistant of Lord Lister, to unveil the statue. Sir Hector, before unveiling the statue, delivered an oration which we give *in extenso*.

Sir Hector Cameron's Address.

I esteem it a very high honour indeed to have been invited to unveil the statue commemorative of Lord Lister, beside which we are now assembled. I am well aware that I owe this honour to the fact—the accidental fact—that I am the sole survivor of those who served under him as house-surgeons in Glasgow and one of the very few still alive who listened to his lectures and witnessed his work in the old College and the old Royal Infirmary in the High Street. I formed a still closer connexion with him after my house-surgeonship was completed, when he invited me to be his assistant in private practice. Above all, it was "he for whose applause I strove; I had such reverence for his blame," and he honoured me with an affectionate friendship to the end of his long life. Such considerations make me feel that, however much I could have wished that some eminent man of science had been invited to occupy the place in which I now find myself, I may console myself with the reflection that I shall at least fulfil, however imperfectly, what I may well regard as a pious duty.

Mr. Joseph Lister became a candidate for the chair of surgery in the University of Glasgow on the death of Professor Lawrie in November, 1859, and his appointment was announced on January 28th, 1860. He was then in his thirty-third year. He had been resident in Edinburgh for some years previously, where, latterly, he had held the post of assistant surgeon to the Royal Infirmary and was an extra-mural lecturer on surgery.

The appointment to the chair in Glasgow did not at that time carry with it the succession to hospital wards, and for the first fifteen months of his professorship he had no opportunity of illustrating by his practice the theoretical teaching which he communicated to his students in his university classroom. He was, however, appointed a surgeon to the Royal Infirmary in August, 1861, and began his work there when the winter session opened.

From the time he began his professorial duties he commanded the enthusiastic admiration of his students. At the end of his first winter session they adopted the very unusual course of presenting him with an address in which they expressed their high appreciation of the lectures to which they had listened and the valuable instruction which had been communicated to them. It is interesting to recall that the member of the class chosen by his fellows to read and present this address to the professor was J. B. Russell, afterwards the first whole-time medical officer of health of Glasgow, a most able public servant of the city, and a pioneer of world-wide reputation in the then nascent science of preventive medicine.

The enthusiasm thus excited in the students of his first class was fully maintained in succeeding years. I became a member of the class in 1862. One of my fellow students was Friedrich Trendelenburg, a son of a professor of the University of Berlin, who had been a friend of Professor Allen Thomson of Glasgow University from their youthful days. Young Trendelenburg had in consequence been sent for two years' study to Glasgow under Professors Allen Thomson, Lister, and William Thomson, afterwards Lord Kelvin. In later years he made for himself a great reputation as professor of surgery in the University of Leipzig, and introduced valuable improvements in the practice of certain departments of the surgical art. With these improvements his name will always be associated. Some years ago, in a letter which I received from him, he observed that, while we all regarded Professor Lister with great respect and admiration, none of us could foresee that he would one day "change surgery from the very bottom." This was a just remark. All of us, indeed, felt conscious that we were listening to new and valuable lessons not yet in print, but little realized how great their value was or what unspeakable blessings were to flow from their development in the near future. It was not, however, until 1865 that Lister began to develop his antiseptic system of wound treatment.

It is not possible on such an occasion as this to explain the details of Lister's method of wound treatment, but in the words of a celebrated French surgeon now deceased, writing in 1902, "it produced in the evolution of our science such a revolution that we ought to judge it as though centuries had passed." "Have we not seen," he asks, "in twenty-five years such a progress as centuries never made?"

And the progress thus made has now largely extended. The principles he taught as the foundation of his system are now universally received and acknowledged by surgeons the whole world over, although in many ways the mode of applying them has become modified. He wedded surgery and science in a manner unattempted before, with the effect, as has been well said, that surgery, and especially operative surgery, has been so changed as to become "a safe and soundly based science" instead of being, as it was formerly, "a hazardous lottery." The result has been the saving of human lives in number beyond all calculation.

Those achievements, you will believe, were not accomplished without indomitable perseverance, and a marvellous patience in the face of great opposition from the majority of the leaders of his profession, especially in his own country. From the very first he was under no illusion in regard to the inevitable and hostile criticism which his doctrines must evoke, especially from those who were prejudiced by a life-long familiarity with the older teaching and the former methods of practice.

In an interesting letter which I some years ago received from Dr. Collins Warren of Boston, a distinguished surgeon of America, he told me of a visit which he had paid to Lister's wards in the Royal Infirmary of Glasgow in the summer of

1869. After graduating at Harvard, he had just finished three years of study at various medical schools in Europe, and had returned to London, on his way back to America, believing that he had learnt all of up-to-date surgery which could be learned. He attended a meeting one evening of the Pathological Society of London, where he heard of a surgeon in Glasgow who claimed to be able to prevent the occurrence of suppuration in wounds, but whose claims were received with much incredulity and no little sneering. He determined at once to spend the last week at his disposal in visiting Glasgow and seeing Lister's practice. He did so, and was immensely impressed by everything he saw. One day, after an interesting discussion on the cases of some of the patients in the wards, Lister addressed his students and visitors, who were for the most part young men, in such words as these:

> "I do not expect my colleagues and contemporaries to adopt my views and to follow such practice as I desire to found upon them. I look to you, the men of the future, to do this."

Quite a generation passed, indeed, before his views were adopted and the guiding principles of his practice, modified no doubt in detail, universally followed, as is now happily the case. His nephew and biographer, Sir Rickman Godlee, refers to another occasion on which he expressed similar sentiments. They were uttered when he was an old man and when his scientific views had been acquiesced in and the practice founded on them imitated in some form all over the world. In November, 1902, he was awarded the Copley Medal by the Royal Society, one of the highest honours which a scientific man can receive. At the anniversary dinner of the society in the evening he returned thanks on behalf of the medallists, and ended his speech by saying that "he had often thought that if he did deserve any credit at all it was at the time when, perfectly convinced of the truth of the principle on which he acted, and persuaded also of the enormous importance to mankind of being able to carry out that principle in practice, he worked for years together with exceedingly little encouragement from his professional brethren. There were two great exceptions, however—his father-in-law and his students." His biographer adds, "He was thinking, no doubt, of the early Glasgow days, before his fame had spread into foreign countries."

Photograph by] [Annan and Sons.

THE LISTER MEMORIAL, GLASGOW.

His father-in-law was the great surgeon, Professor Syme of Edinburgh. Lister remarked to me more than once after he had become an old man that, in looking back, he felt it was a fortunate circumstance that, at the particular stage of his career which had arrived in 1860, he was called to an independent position in Glasgow. He then became his own master and was free to work out his own ideas. He frequently visited Mr. Syme at Milbank, his residence near Edinburgh, talked to him fully of the work he was doing in Glasgow, and received from him, from first to last, nothing but the greatest encouragement and approval.

My Lord Provost, I think we ought to feel very grateful to the municipal authorities of this city for having granted us this excellent site. A very little reflection makes me feel how eminently suitable it is. Lister, when he was engaged in thinking out some difficult problem or in composing some important paper, preferred to do this, if the season and weather permitted, in the open air, and preferably during an hour or more before breakfast. For this purpose this park was his favourite resort. Very soon after he settled in Glasgow at 17, Woodside Place, when speaking, in a letter to his father, of an article which he was writing for publication, he says: "I find this a very nice place for working at; the Park being an excellent 'Academia' for peripatetic study, and most of what I have written has been composed there and written there in a little pocket note book." His favourite walk was under a row of tall elms which ran along just inside the railing in front of Royal Terrace, and sheltered in their branches a colony of rooks; alas! they have long ago disappeared. Then the monument of his colleague Lord Kelvin is only distant from his a few paces. They became colleagues when Lister entered the Senate of the University in 1860, and a fast friendship existed between them until the death of Lord Kelvin in 1907. In their later years they were office bearers together in the Royal Society, and on the demission of the presidency of the society in 1895 by Lord Kelvin he was succeeded by Lord Lister. The site, too, is in the immediate vicinity of the modern home of the ancient University upon which both have shed such bright and lasting lustre.

I have heard the remark made frequently of late that we might have commemorated Lister by some better and more useful means than by this statue. His fame, say such persons, is his real monument, and it will outlast your bronze. This may be true; but no stone now stands upon another of the old College in the High Street, or of the old Infirmary in which he laboured; and surely it is not unfitting that we should raise some visible symbol expressive of our gratitude to one of the greatest benefactors of the human race—expressive, too, of our pride in the fact that the principles of antiseptic surgery were first discovered, enunciated, and carried to a successful practical issue while he still occupied the chair of surgery in our University.

Principal Sir Donald MacAlister proposed a vote of thanks to Sir Hector Cameron in felicitous terms. He said that as a pupil, an assistant, a disciple, a friend, and an able and inspiring interpreter of Lord Lister, none could have been more fittingly chosen to grace the ceremony, and none could have explained its significance to them in happier terms than Sir Hector Cameron. He congratulated the sculptor on his successful presentation of the features and bearing of Lord Lister. Finally, he expressed thanks to the Memorial Committee and to the executive, who collaborated not only in providing this statue for Glasgow, but in contributing substantially to the international fund for the provision of a Lister Prize and Lectureship, for the memorial in Westminster Abbey, and for the due display and preservation of the Lister Collection in the Glasgow Royal Infirmary. Professor John H. Teacher, on behalf of the committee, asked the Lord Provost to accept the statue as a symbol of their homage to Lord Lister.

Prior to the unveiling ceremony a company was entertained to lunch in the City Chambers by the Lord Provost and members of the Lord Lister Committee. The guests included Mr. J. J. Lister, F.R.S., of Cambridge, a nephew of Lord Lister. The "Undying Memory" of Lord Lister was toasted in silence by the company. The Lord Provost of Edinburgh, Sir William Sleigh, proposed the Glasgow Lord Lister Memorial Committee, and in so doing emphasized the happy relations existing between Glasgow, where Lord Lister carried out his great work, and Edinburgh, to which he came on leaving Glasgow. Mr. A. E. Maylard, M.B., B.S., proposed the health of the chairman, and Sir Donald MacAlister gave the toast of the Lister family, with which he coupled the name of Mr. J. J. Lister. The latter, in his reply, gave some very interesting personal reminiscences of his uncle Lord Lister, illustrative of his enthusiasm as a worker and his lovableness as a man.

England and Wales.

SMALL-POX IN ENGLAND AND WALES.

THE Ministry of Health has supplied the following statement for publication:

At the present time small-pox is prevalent in the county borough of Middlesbrough, the borough of Chesterfield, and the urban district of Hucknall, in all of which districts the disease has continued to be present since the autumn of 1923. Other sanitary districts now mainly affected are the county borough of Derby, the rural district of Chesterfield, the borough of Mansfield, and the urban districts of Mansfield Woodhouse, Ashington, Melton Mowbray, and Gainsborough. Within the last four weeks sporadic cases have occurred in twenty-one other sanitary districts, including the metropolitan borough of St. Pancras, the county boroughs of Barnsley, Leeds, Leicester, Sheffield, and Oxford. On three separate occasions this year a single case of the disease has been notified from different metropolitan boroughs. There is no evidence of the presence of small-pox in London at the present time. In 1924, up to the end of the second week in September, small-pox has appeared in ninety-one sanitary districts in England and Wales, including four port sanitary districts. The total number of cases is approximately 2,750, as compared with 1,840 in the corresponding period of 1923. The county most heavily invaded is Derby, with a total of approximately 1,080 cases in sixteen sanitary districts; the next in point of number is the contiguous county of Nottingham, with 434 cases in ten sanitary districts; 386 cases have occurred in Yorkshire (mainly in Middlesbrough), and 306 in Northumberland (mainly in Ashington). Of the Derbyshire cases more than one-half have occurred in the borough and rural district of Chesterfield. Although generally the type of disease continues to be mild, severe cases occur from time to time; in the Willesden urban district in June and July there were 10 cases with 3 deaths.

ORDER OF ST. JOHN OF JERUSALEM: PRIORY FOR WALES.

Sir Herbert D. W. Lewis, K.B.E., Commissioner for Wales of the Order of the Hospital of St. John of Jerusalem, in his report for the year ending December 31st, 1923, is able to point to a steady progress in the work of the ambulance and nursing divisions in the Principality, which is of happy augury for the future. The numerical strength of the brigade is, roughly, 6,000 men and women. Ambulance arrangements have been made to cope with accidents at collieries, factories, football matches, race meetings, and all public functions. First-aid tents have been pitched at holiday resorts, and very many cases of accidents and disease have received attention during the year. In addition to training adults in ambulance and nursing work, the Priory has also inaugurated a scheme for the training of boys and girls, which has been adopted in many Welsh towns and villages. The affiliation of the ambulance teaching of the older boys in the Scout movement to the St. John Ambulance Brigade has benefited both organizations alike. The ambulance department, comprising the teaching of first aid, home nursing, home sanitation, home hygiene, and allied subjects, has issued 7,890 certificates and awards in 1923, as compared with 5,466 in 1922, and 3,207 in 1921. Thirteen medals awarded on the completion of fifteen years' service in the brigade were presented during the year. In 1922 the ambulance work of the Great Western Railway was affiliated to the St. John Ambulance Brigade, with very successful results, and on January 1st, 1924, the corresponding training in the London, Midland and Scottish Railway was similarly affiliated. The motor ambulance transport service, which is the second largest in England and Wales, carried during 1923, 2,294 patients, involving a mileage of over 40,000. Provision is made for every colliery, factory, and householder to have the right to summon an ambulance car at any time of the day or night in return for a small annual subscription. The stores department at headquarters has dealt with a large demand for first-aid manuals, appliances, uniforms, and apparatus during the year, and, through the medical comforts depots scheme, any medical requisite may be borrowed at a nominal cost in cases of sickness or accident. The Priory for Wales is now represented on the Welsh Committee of the Central Joint Voluntary Aid Detachment Council, and has taken steps to enrol its quota of members throughout the Principality, in accordance with the new scheme for voluntary aid detachments. The work at the Swansea Orthopaedic Clinic for Ex-service Men, and at the spa treatment establishment at Llandrindod Wells, has made considerable progress during the year, and large numbers of people have been benefited.

A NEW LIVERPOOL HOSPITAL.

Realizing the importance of prevention of disease as one of the objectives of modern medical science, to which so much attention was drawn at the recent Congress of the Royal Sanitary Institute, held at Liverpool last July, a movement to found a special hospital for the treatment of diseases of the heart has been initiated. At the inaugural meeting Professor Caton, Pro-Chancellor of the University and Emeritus Professor of Physiology, who, while physician to the Royal Infirmary, devoted special attention to these diseases, urged strongly the desirability of establishing such a hospital, since prolonged rest, therapeutic measures, and remedial exercises were essential in many cases of rheumatic fever if valvular heart disease was to be prevented. It was pointed out that the general hospitals, with beds limited to cases of acute illness, did not provide for cases of heart disease requiring long-continued rest. A special hospital adapted for modern methods of treatment would meet a real want, and a promise of substantial financial aid for the scheme was announced. Professor J. Martin Beattie supported the movement, and a general committee was formed with Sir James Paton as chairman. It is hoped that, with the funds in hand, the new hospital will be opened in two months' time. Accommodation for in-patients will be provided to the extent of ten to thirty beds. An out-patient department will also be established for those cases that do not require prolonged rest, but rather remedial exercises and appropriate therapeutic treatment.

MEDICAL OFFICER OF HEALTH FOR LIVERPOOL.

Dr. Arthur A. Mussen, assistant medical officer of health for the City of Liverpool since 1900, has been selected by a special subcommittee for recommendation to the Health Committee and the City Council for the post of medical officer of health for the city. Twenty-nine candidates had sent in applications, and six of these were interviewed. The esteem in which Dr. Mussen is held by the medical profession in Liverpool called forth the following resolution of the Liverpool Division of the British Medical Association in July last:

> This meeting of the Liverpool Division of the British Medical Association, hearing that Dr. A. A. Mussen is a candidate for the post of medical officer of health of Liverpool, desires to record the fact that during the twenty-four years he has been in collaboration with the members of the medical profession in Liverpool, on the many problems of infectious disease and public health, he has gained their complete confidence and respect.

MANCHESTER ROYAL INFIRMARY.

A course of post-graduate lectures and demonstrations at Manchester Royal Infirmary commences on September 30th with a lecture by Mr. J. Howson Ray, on carcinoma of the rectum, operable and inoperable. On the following Tuesday the Lloyd Roberts lecture will be delivered by Sir John Bland-Sutton, President of the Royal College of Surgeons of England, who will speak on the subject of "Attic salt for gall stones." The post-graduate lectures will be continued on successive Tuesdays until December 16th. Short courses of lectures on special subjects explaining recent scientific research work will be given on Fridays, commencing on Friday, October 3rd, when Professor H. S. Raper will give the first of two lectures on fat metabolism and some of its disorders. All these lectures will commence at 4.15 p.m.; no fee is charged. The titles of the succeeding lectures will be found in our Diary columns during the coming weeks. The honorary secretary for post-graduate courses is Dr. E. Bosdin Leech.

Ireland.

APPOINTMENT OF POOR LAW MEDICAL OFFICERS (FREE STATE).

For more than a year the management of the Dublin Union has been in the hands of commissioners or vice-guardians who were appointed by the Ministry of Local Government and Public Health when it dissolved the local board of guardians. The commissioners possess all the powers of a board of guardians with regard to administration and appointment of officials. In the circumstances the correspondence which has passed recently between the Ministry of Local Government and Public Health and the commissioners, with regard to the filling of medical vacancies, is significant, and has given much satisfaction to the medical profession in Ireland as a step towards a proper system of making medical appointments on merits alone. In connexion with the appointment of four dispensary medical officers for the Dublin Union a letter was read, at the last meeting of the commissioners, from the Ministry of Local Government, stating that the Minister considered it would be greatly in the public interests if the commissioners could establish a special Selection Board to appraise the merits, qualifications, and experience of the applicants. The commissioners decided to write to the registrars of the medical schools of University College, Trinity College, and the Conjoint Board of the Royal Colleges of Physicians and Surgeons, asking them to appoint a representative each to act as a Selection Board, the chairman of the Dublin County Council to be asked to act as chairman. It is understood that the commissioners are prepared to elect the persons selected by such board to the present vacancies.

MEDICAL ASSISTANCE AT OPERATIONS IN WORKHOUSE HOSPITALS.

The Ballymoney board of guardians, County Antrim, recently demanded from Dr. McClelland, medical officer of the workhouse, an explanation of why, instead of summoning medical assistance himself, he did not comply with the regulations and have such assistance provided by the master of the workhouse. In his reply Dr. McClelland stated that he was forced to make the arrangements himself in the interests of the patient, who was suffering from an appendicular abscess. To carry out the regulations would have meant such a delay as to imperil his patient's life. In the circumstances he arranged with the nearest available doctors, and he (Dr. McClelland) had never yet seen a major operation undertaken without the presence of three doctors. One of the guardians stated that the doctor's explanation was not really very satisfactory, and the board decided ultimately to forward Dr. McClelland's letter to the Ministry of Home Affairs (Northern Parliament). At a meeting of the Omagh guardians a letter was read from the Ministry of Home Affairs, stating that the board should pay a fee of £21, claimed by Dr. E. Thompson, F.R.C.S.I., surgeon to the Tyrone County Hospital, for performing a serious surgical operation, provided the patient was properly admitted to the workhouse hospital and that Dr. Thompson was requisitioned in accordance with the workhouse regulations. The guardians decided to pay the fee to Dr. Thompson.

PRESENTATION TO DR. P. GRACE, KILKENNY.

On his promotion to the post of superintendent of the Maryborough Mental Hospital, Queen's County, Dr. Pierce Grace has been presented with a handsome case of cutlery subscribed by the officers and staff of the Kilkenny Mental Hospital, where Dr. Grace has acted for many years as assistant medical officer. Dr. Pierce Grace was for several years a very efficient secretary of the South-Eastern of Ireland Branch of the British Medical Association. The Maryborough Mental Hospital, which serves as the district asylum for King's and Queen's Counties, is an institution of 623 beds, and was established ninety years ago.

Correspondence.

HERPES ZOSTER IN HODGKIN'S DISEASE, AND ARSENICAL TREATMENT.

SIR,—It was, I believe, Sir Jonathan Hutchinson who first drew attention to the occasional development of herpes zoster in patients undergoing arsenical treatment, and in the epidemic of chronic arsenical poisoning amongst beer drinkers in England, in 1900, it was the occurrence of herpes zoster in some of the victims that led E. S. Reynolds to the discovery of the real cause of the symptoms.

I have met with a few cases of Hodgkin's disease (lymphogranulomatosis maligna) in which an attack of herpes zoster constituted a temporary complication, but these were cases which were being treated with arsenic. As far as I can remember I have never seen herpes zoster in patients with Hodgkin's disease apart from arsenical therapy.

Recently, however, Professor H. K. Pancoast and Dr. E. P. Pendergrass have written a paper on the occurrence of herpes zoster in Hodgkin's disease,[1] in which four cases of the disease complicated with herpes zoster are summarized. Arsenical therapy is so frequently employed as part of the treatment for Hodgkin's disease that as it is not definitely stated that the patients were given no arsenic, one is to my mind almost justified in assuming that the herpes zoster in all the four cases was "arsenical" in origin rather than due to the Hodgkin's disease itself.

It seems that arsenical therapy sometimes predisposes patients to an attack of herpes zoster, and that an attack of herpes zoster during arsenical therapy, though a warning sign, does not necessarily signify that arsenic is being given in excess. In fact, it appears that herpes zoster occurring during treatment with arsenic is to be regarded not as a direct toxic effect, but rather as an attack of ordinary herpes zoster, to which the arsenic in some unknown way has rendered the patient liable. But here one is on uncertain speculative ground. Does an attack of so-called "arsenical herpes zoster" shield the individual from subsequent attacks of (ordinary) herpes zoster? Has anyone seen herpes zoster in a patient who is known to have suffered previously from "arsenical" herpes zoster? Has anyone seen herpes zoster in Hodgkin's disease when arsenic could be definitely excluded as a factor in the causation?—I am, etc.,

F. PARKES WEBER, M.D., F.R.C.P.

London, Sept. 20th.

GALL STONES AND CANCER.

SIR,—Like Mr. McAdam Eccles, I was much interested in Dr. Archibald Leitch's lecture on "Gall stones and cancer of the gall bladder."

I introduced one or more gall stones into the gall bladders of dogs under aseptic conditions. The results were published in this JOURNAL in 1905. The stones disappeared in every instance within two months. The late Vaughan Harley had previously performed similar experiments. He kept the dogs alive for twelve months after each experiment, and at the *post-mortem* examinations the stones had completely vanished. I concluded from my experiments that in dogs the normal bile will dissolve any medium-sized stone. The results in guinea-pigs seem to be entirely different.

My object in writing this note is to suggest that it would be unwise to draw deductions from experiments upon guinea-pigs in relation to the incidence of cancer in cholelithiasis in the human subject.—I am, etc.,

WILLIAM BAIN.

Harrogate, Sept. 21st.

SIR,—Now that Dr. Archibald Leitch's brilliant experiments have demonstrated that cancer can indubitably be caused by simple mechanical irritation, it only remains to be shown *how* mechanical irritation can produce cancer and the tale will be told.

The conditions found in one after another of his guinea-pigs reveal very clearly a struggle for existence on the part

[1] *Amer. Journ. Med. Sci.*, Philadelphia, 1924, clxviii, p. 326.

of the epithelial cells lining the gall bladder, comparable, surely, to the struggle for existence of any species of unicellular organism faced with a new and menacing addition to its environment. The existing generation of cells is beaten down, almost exterminated, but from the depths of the glands new generations of cells arise, push up to the surface, and are destroyed in their turn. The qualities that count in this struggle are the capacity for rude growth and rapid reproduction, and by a process of natural selection among the cells these qualities become the distinguishing characteristics of the succeeding generations. It is really a process of reversion to type—reversion of the highly specialized tissue cell under the stress of hard times towards the primitive protozoal ancestor of all cells; just as highly specialized plants and domestic animals devolve backwards towards ruder ancestral types when removed from their artificial environment and forced to breed wild.

The tissue cell has an inherent respect for boundaries, and many stages on the road of reversion must be passed before the riotously growing product of the process pierces the limiting membrane of its normal habitat and invades its orderly neighbours. These must inevitably yield before the uncivilized hordes, as the Romans before the Gauls, and so the whole picture of cancer develops.

All this has been laughed at before as "fanciful" and "pure theory." But obsession with experimental methods should not altogether exclude the philosopher's armchair excogitations. The theory fits the facts, and no one has ever been able to show me where the analogy breaks down. Its kernel lies in the ability to visualize the cells of the animal body as individuals having, in addition to their civic responsibilities, a life of their own, their own infinitesimal variations of structure and quality, and an obedience to the laws of growth and reproduction and the origin of species which we believe to operate throughout the living world.—I am, etc.,

Ashton-under-Lyne, Sept. 15th. J. V. FIDDIAN.

TREATMENT OF PUERPERAL SEPSIS.

SIR,—We do not see why the staff of Queen Charlotte's Hospital should be surprised that Dr. Canney should advocate exploration of the uterus in septic cases.

We have both had a large obstetric practice extending over many years, and have always carried out this treatment in cases of definite infection of the uterus where the temperature has remained up for over twenty-four hours, and have never seen it cause general septicaemia. In almost all these cases small pieces of placenta or membranes have been found and removed, and the patients have nearly all of them shown immediate benefit. Those cases where septicaemia has developed have been those where exploration has not been carried out early enough owing to a doubt as to whether the trouble was definitely uterine.

We quite agree with Dr. Canney that it is impossible to say without exploration whether the placenta is complete or not, for in many cases of post-partum haemorrhage small pieces are found which it is impossible to fit into the recently expressed placenta.

It has been our practice at the East End Mothers' Home to explore and douche, with the result that during the last ten years, out of over twenty thousand deliveries, there has not been a death from sepsis, so that in our opinion the danger feared by the staff of Queen Charlotte's Hospital is more than counterbalanced by the good done; and until other hospitals can show statistics which compare favourably with these we think that practitioners would do well to continue the old method, laying stress on Dr. Canney's advice, "with the greatest care and all possible gentleness."—We are, etc.,

M. CURSHAM CORNER, M.D.
W. H. F. OXLEY.

London, E.1, Sept. 16th.

SIR,—I was very interested in the letter of the staff of Queen Charlotte's Hospital (September 13th, p. 488), and am glad to see that they discourage "meddlesome midwifery." I am all the more interested because I was called in to a case of puerperal septicaemia a few weeks ago.

The woman was confined on August 5th, and on the morning of August 9th I saw her with a pulse of 140 and a temperature of 104.6°. The lochia were very offensive. I obtained some antistreptococcus serum (multivalent) of the Lister Institute, and I gave 10 c.cm. subcutaneously in the loin that same evening. She had one perchloride douche, and afterwards two lysol douches a day for three days, finishing up with one a day for a few days longer. The day after the injection of the serum the temperature fell to 99° and the pulse to 86. A slight rise of temperature took place on August 13th, but on August 17th the temperature was normal and continued so. The patient made a good recovery.

I have been very fortunate not to have had a single case of puerperal septicaemia in about 1,500 midwifery cases whom I was engaged to attend.—I am, etc.,

PHILIP LAMBERT BENSON, M.A., M.D.

Steeple Claydon, Bucks,
Sept. 16th.

SUGAR AND MIGRAINE.

SIR,—Migraine has been ascribed to so many causes, and the treatment is so diversified, that it is justifiable to conclude that the etiology is imperfectly understood. It is said that attacks usually cease after the age of 50 or 60.

I have not noticed that an excess of sugar in the blood has been mentioned as a cause. I believe it to be, however, a potent factor in migraine, and that many persons who now regularly suffer from migraine will find the attacks disappear entirely if sugar be eliminated from the diet. The drawback to this deprivation of sugar is that these individuals, who have been depending on sugar for much of their nervous and muscular energy, may find that they cannot bear muscular exertion so well, and that the heart's action is not so strong and steady.

Experiments appear to warrant the conclusion that the effect of emotional excitement—of stimulation of the sympathetic nervous system—is a call-up of the sugar supplies; shall we say a flooding of sugar into the blood? The issue, then, will be: Can this extra amount of sugar be properly dealt with?

The sugar has to be oxidized into carbonic acid and water. The exact chemical changes are unknown. Professors Bainbridge and Menzies suggest that lactic acid and pyruvic acid are intermediate products. Some persons respond readily to emotional stimuli; their sympathetic nervous system is strongly active, and if there be already a surcharge of sugar in the system, the additional mobilization may be such that the chemical changes, including oxidation, are defective, and there may be, as in diabetes, a toxic acidosis. May not migraine be a toxic acidosis? To those who are liable to it, I would suggest that they cut down their supplies of sugar, particularly at times of mental stress, and though, as a rule, sugar and carbohydrates should be taken sufficiently to produce fuel for muscular energy, fresh air and deep breathing will be necessary to bring about oxidation of the sugar in the blood, and also bodily exercise to work off any sugar excess.

One main reason why migraine diminishes in frequency and severity after middle age may be that the individual, having taken to heart the lessons of the past, is more nonchalant, more indifferent to results. So many things which previously were emotional stimuli no longer excite, or excite in diminished degree, the sympathetic nervous system.—I am, etc.,

Devizes, Aug. 23rd. G. N. W. THOMAS.

MINERAL ELEMENTS OF FOOD IN RELATION TO HEALTH.

SIR,—It is to be regretted that Dr. John Boyd Orr, in his very instructive paper you report in your columns (September 20th, p. 504), does not include in his remedial measures to meet the deficiency of mineral salts in the average diet the use of whole wheat flour as opposed to white flour.

It is evident, from the figures in Table I of his paper, that, while white flour is very deficient in mineral salts, whole wheat—and especially the bran constituent—is comparatively rich in these substances and compares favourably in this respect with milk, which in this particular he takes for his standard.

Of the importance of training children to eat whole wheat bread there can be no doubt whatever. If there be individuals whose digestive powers cannot deal with it—and this is doubtful—they are already the subjects of disease and disorder of the alimentary tract. The healthy child can digest it, and no other kind should ever be offered to children. Instead of the patent cereal foods whole wheat flour should be used as soon as the child is weaned. Later it should be given the crusts of the whole wheat loaf to cut its teeth on; and in the nursery and in the schools the growing boy and girl should see no other loaf, nor be given any opportunity to develop the vitiated taste for white bread.—I am, etc.,

London, W., Sept. 22nd. S. HENNING BELFRAGE.

WHOLEMEAL BREAD.

SIR,—About two decades ago a brown bread campaign was brought prominently before us by Sir Prescott Hewitt, and although it was without the scientific information which we possess to-day, yet the profession was in accord with its supporters. The difficulty of its preparation was the crux of the serviceableness of this diet to the general public. To overcome the roughness of the grain meal by the miller's stones demanded fine trituration. The millers were not prepared to supply offhand the coarse, medium, and fine meal; the additional cost was no little consideration. The Thanet wheat of Kent was boomed as a fine cereal growth, and I believe Sir Prescott Hewitt advocated the Riverden Mills in Ramsgate as possessing a special plant for the process. Bread was prepared from this celebrated Thanet wheat, and it was also put up in the form of shortbread with added milk. But it was found to be too heavy and not easily leavened by yeast fermentation. Thus, as a dietetic article it was only sparingly consumed by a few people. Crushed cereals under varying proprietary ownership have to some extent replaced wholemeal bread. The question has yet to be solved whether the stickiness of these food preparations, taken in the form of porridge, is to the best advantage of human dentition. Nevertheless we should be in a position to advise our patients what is the best substitute for the present unsatisfactory white loaf.—I am, etc.,

Cheltenham, Sept. 15th. JOHN FRED. BRISCOE.

PICRIC ACID DERMATITIS.

SIR,—Having read with interest Dr. Semon's memorandum in last week's issue of the BRITISH MEDICAL JOURNAL (p. 520) under the above heading, I wish to endorse all that he says on the subject.

In our textbooks which refer at all to this particular drug eruption the description of the rash is dismissed by saying it is like measles or scarlet fever. A case which I was asked to see recently presented the following appearances. The skin of the limbs at the site of the dressing and near it was inflamed, with here and there a bulla, as though a mustard plaster had been applied and left on too long. On the trunk it was blotchy and of a pale pink colour. Several of the blotches were slightly oedematous, with well defined margins, not unlike those seen in erythema multiforme. Some of these when pressed upon showed a faint purpuric staining.—I am, etc.,

ALFRED EDDOWES, M.D., M.R.C.P.

London, W.1, Sept. 21st.

TREATMENT OF PNEUMONIA IN AN OXYGEN ATMOSPHERE.

SIR,—I herewith enclose the record of two experiments made during an attack of pneumonia contracted by two of my chimpanzees. I thought it might perhaps interest some of your readers to know the details of the beneficial results obtained by the administration of oxygen in such unusually large doses.

Two chimpanzees, used in my laboratory for antituberculosis tests, accidentally developed symptoms of acute mucopurulent infection of the air passages accompanied by severe constitutional symptoms. Dr. Stephani and Dr. Trechsel both diagnosed pneumonia. This opinion was confirmed by microscopical examination.

CASE I.

Chimpanzee Alice; female, 2½ years old.

April 5th: Cough; anorexia; lassitude. Treatment: 6 drops of turpentine twice a day in milk, and half a spoonful of Famel's syrup. To stimulate the appetite, one drop of arrhenal and one-third of a teaspoonful of granulated condurango and kola were given morning and night.

April 7th: Cough; sputum; purulent nasal discharge; anorexia; prostration; breathing very fast and short (60 respirations a minute); pulse uncountable. Rectal temperature could not be taken, as the animal was getting very upset at each attempt to use the thermometer. Microscopical examination showed the presence of a very large number of pneumococci, with occasional bacilli of Friedländer, in sputum and nasal discharge.

April 8th: Animal much worse, extremely weak; 70 respirations a minute; condition of collapse; long and violent attacks of cough; râles perceptible without the stethoscope. Codeine syrup was then given repeatedly, also spiritus ammonii anisatus. By this time dyspnœa had become very severe, and massive doses of oxygen were then administered. To obtain the full benefit of the oxygen the animal was placed four times a day (morning, afternoon, evening, night), for three-quarters of an hour each time, in a little box just large enough to contain the ape; the box was then closed completely, and oxygen introduced by means of two pipes, one at the bottom and one at the top, while a small ventilating hole was made at the opposite side. Thus, 400 litres of oxygen were passed through the box each three-quarters of an hour, during which time the chimpanzee was breathing pure oxygen, her exhalations being constantly driven out by the current of oxygen. The improvement was remarkable and very rapid, and is attributed to the massive doses of oxygen, which were continued in gradually decreasing doses for a fortnight, while the general treatment (turpentine, Famel's syrup, arrhenal, kola) lasted three weeks.

CASE II.

Chimpanzee Vera; female, 3½ years old.

April 10th, 1924: Cough; anorexia; prostration. The animal remained quiet in a corner, refusing to move or eat. Treatment the same as for previous animal (turpentine, Famel's syrup, arrhenal, condurango, codeine, spiritus ammonii anisatus).

April 12th: Violent and frequent attacks of cough; much sputum; abundant nasal discharge; complete anorexia, except for some sugar water with a little milk containing the remedies; pulse and temperature could not be taken; breathing short and of a whistling type; 80 respirations a minute, not only at times but all day long; condition of collapse. Large number of pneumococci and a few bacilli of Friedländer in sputum and nasal discharge. Massive doses of oxygen were then administered as described above, and within forty-eight hours the animal showed such an improvement that it could be considered out of danger, although the sputum and nasal discharge containing the above-named micro-organisms lasted during several more days.

The two chimpanzees made a complete recovery and are now in perfect health. In both cases the symptoms of pneumonia seem to have been most rapidly and favourably influenced by means of the large quantities of oxygen given daily. The facts—(1) that pneumonia is usually fatal in chimpanzees; (2) that all acute symptoms disappeared before the usual time of a normal crisis; (3) that the improvement was very great and most rapid as soon as the oxygen was administered—seem to indicate that the oxygen *given in massive doses* had a remarkably beneficial effect.—I am, etc.,

H. SPAHLINGER.

Institut Bactériothérapique, Carouge, Genève, Sept. 13th.

THE "E.R.A." CULT.

SIR,—A short while ago you had an article on E.R.A. advising those practising it to give it up on the grounds that they did not know what they were doing. Were this applied all round the bulk of medical practice would cease forthwith. In the practice of E.R.A. work as carried out by some of us, we can make a claim that cannot, I think, be quite paralleled in any other branch of work—that is, we can give a minute test dose or series of test doses to our subject till we hit on the right dosage for our patient. The original 10 rate distribution unit has had fitted to it by our consulting electrician, Mr. Yeo, an intermediate 10 rate. We find that after a short period of vibration the organisms affecting the patient alter, and that to abolish the reflex caused by them we have to use, say, in the case of streptococcus, a 2.1 rate in place of 2; a week later we have to use 2.2. Other organisms vary but do not appear to require such rapid changes of rate as the streptococcus.

The change of rate necessary to abolish the reflex is got by holding an electrode attached to a treatment unit about two feet from the subject. Personally I test the reaction with the finger, and consider the reflex abolished only when a silky smoothness takes the place of the gritty feel got when the reflex is present. The fact that a change is necessary shows we are affecting the organism we are dealing

with. This change may well be due to an attempt on the part of the micro-organism to change into something not affected by the vibrations. Past failure to deal with the streptococcus is probably due to its capabilities of change, or possibly may be due to the presence of a number of allied species, all of which have to be dealt with. As all organisms I have treated seem to do the same thing, it is more likely that they all undergo a metamorphosis. E.R.A. is a progressive business, and every month brings some fresh discovery. As now arranged by the advice of our electrician, Mr. Yeo, we are getting vibrations which can be heard with an audiphone two feet from the patient's body and felt easily on contact with the patient. As far as one can judge from a short experience, these more powerful vibrations produce more rapid effects. I am now thinking the whole matter stands or falls by the diagnosis; according to most general practitioners and the public the one matter of importance is results. I claim that the results are good, but can be vastly improved by the physician and electrician working together. Scarcely a month passes without some improvement in technique being found. Fresh wave rates are being worked out for certain organisms which, if present rates represent the trough, the new rates will represent the crest of the wave.

As a means of diagnosis Abrams's instruments give opportunities afforded by no other means. Without puncture of the skin or other structures it is possible to prove the presence of organisms and their character in any position in the body. It is because one can ascertain the cause of various troubles that one can often relieve cases which have baffled a long series of medical men for years. To cease investigation and treatment on these lines would be to put back the clock. This will not happen in England; we may be slow and conservative, but we hang on. I believe I am right in saying that the cure of a certain class of nerve cases is only possible in a reasonable number of months by E.R.A. methods. All I need say about diagnosis now is this: Since the guide for my treatment of the case is the measured vibration from my oscilloclast, which will abolish the reflex caused by the organism I am treating, it does not matter what the name of the organism is. For example, I get a patient who has suffered from headache and nerve symptoms; I find from the spleen and certain positions on the head a large number of units of rate 57; taking the personal rate I find rate from the oscilloclast; 3 abolishes the reflex, and later 3 or its decimals relieves the condition. Am I, because there is scientific doubt as to the diagnosis, to cease using the oscilloclast?

While we are relieving pain we are also in a humble way adding to human knowledge. E.R.A. work honestly done is not rule-of-thumb but a matter of adjusting rates of vibration and duration of treatment to the needs of each particular case. It has infinite possibilities, and deserves the support of the profession.

The effects of vibration from organisms are so permanent that they will remain for weeks and months, perhaps years, unless disturbed by magnetic waves. When the *Scientific American* observers abstracted blood from the dynamizer and were amused that the operator got the same result whether the specimen was present or not, they had struck an interesting fact unwittingly, but instead of seeking the cause they jeered at the observer. I have repeated the experiment while my subject was not looking and find the vibrations remain the same in character. To remove these the use of a magnet is necessary. My partner, Dr. Hessey, pinned a carcinoma blood on the wall for practice in testing; the spot where it had been gave a carcinoma reaction three weeks afterwards. While results remain good and there are a world of interesting phenomena to investigate, to drop E.R.A. would be cowardly folly.—I am, etc.,

W. G. RICHARDS, M.B.,
Major I.M.S.(ret.).

St. Leonards-on-Sea, Aug. 15th.

MEDICAL OFFICERS AND CONSULTING FEES.

SIR,—In the JOURNAL of September 20th appears a short letter from "Tuberculosis Officer" on this subject. It is singular that he has not signed his name, and it has been my custom in the past to reply to remarks only from those who so sign, but upon this occasion I will do otherwise.

This correspondent appears terribly aggrieved at the recommendation of the Representative Body at Bradford, which he says he reads with amazement—that is, that "whole-time" medical officers should not accept fees for private consultations as he has already done. I trust he has had the sanction of his council. When these gentlemen are worth consulting let them by all means be consulted in the ordinary course of their duties as a whole-time official, but "Tuberculosis Officer" appears to regard his fee as the essential part of a consultation, which is a poor ideal.

I agree entirely with the recommendation of the Representative Body at the Bradford meeting. The profession must be disappointed with the results of this special treatment of tuberculosis.

I venture to suggest that those gentlemen who act as tuberculosis officers are, many of them, not well selected. Many of them have never even been a house-physician, much less one in a chest hospital, and often receive their appointments as a step up the ladder after being an assistant school medical officer. Many of them are quite juniors with no previous special training in chest diseases. Their salaries are good, and in many cases too high for the work they do in comparison with the work done and hours of duty and income of a general practitioner after he has deducted his expenses, which the tuberculosis officer has found for him.

These whole-time medical officers are not necessarily specialists in the sense understood by those who desire expert advice, and it is a title that they have wrongly assumed for themselves; the profession, moreover, as a whole does not recognize them as such, and all their efforts will not reverse the recommendation referred to, as "Tuberculosis Officer" suggests.—I am, etc.,

ARTHUR M. BARFORD.

Chichester, Sept. 20th.

THE GENERAL PRACTITIONER AND PREVENTIVE MEDICINE.

SIR,—I wish strongly to deprecate the differentiation attempted by "Whole Time" (September 20th, p. 543) between, on the one hand, the tuberculosis, venereal disease, and child welfare officers, who are, or should be, specialists, and on the other the assistant school medical officer, who need only be a junior man or woman. Surely the assistant school medical officer is, or should be, a physician with a broad outlook on children and their diseases, and a special leaning towards preventive medicine. He should be able to give a reasonably sound opinion on a child's chest and write an intelligent report on his or her mental condition. His professional status should be such as to command the confidence of the parents, the teachers, and the general practitioners of his area, to whom he refers certain cases for treatment. He can hardly be expected, in addition, to estimate errors of refraction and to enucleate tonsils with proper efficiency. Such work is appropriately given to others, whether part-time or otherwise.

Although I have been qualified nearly ten years, I do not find the inspection of school children, in my area at any rate, either easy or merely routine.—I am, etc.,

M.A., M.D., D.P.H.

September 20th.

EARTHENWARE OR ENAMEL?

SIR,—Within a few months I have been called upon to attend two young women with buttock wounds; in both cases the wounds were the result of the breaking of a "chamber" when in use. During thirty odd years of practice I have had to deal with this accident not a few times, and no doubt my experience in this respect is a common one in the work of most practitioners and hospital house-surgeons.

It seems to me that in these days when enamelled ware of all kinds is turned out so elegantly there should be no difficulty in replacing the earthenware utensil now in general use by something which would entirely eliminate the risk of such accidents.

In my opinion this is a desirable reform which the women doctors of the country might well advocate, and I believe most lay women would be ready to adopt it.—I am, etc.,

FRANK C. FORD.

London, S.W.19, Aug. 24th.

The Services.

THE HEALTH OF THE NAVY.

THE report for 1921 of the Director-General of the Medical Department of the Navy is the first issued since that for 1915, the preparation of the statistical reports for the years 1916-20 inclusive having been cancelled by order.[1] Since there are therefore no figures for any of these years available for comparison with the 1921 figures, it has been found necessary for this purpose to make use of the figures for 1909-13. An improvement in the general health of the fleet in 1921 is discernible, as compared with this five years' period, there being a relative decrease of 56.76 per 1,000 in the total number of cases of disease and injury entered on the sick list. For the total force the average per man was 0.53, as compared with 0.64 in 1913, the number of such entries on the different stations being: East Indies 1.22, China 0.91, Mediterranean 0.66, North America and West Indies 0.61, Africa 0.61, Home Station 0.56, Irregular List 0.50, and Atlantic Fleet 0.48. Moreover, the average loss of service for each individual in 1921 compares favourably with the five years' ratio, and also with that for 1913. The ratio of final invaliding out of the service was 23.22 per 1,000, as compared with 15.46 in the five years' period. The death ratio in 1921 was 3.58 per 1,000, as compared with 3.21; of the total number of deaths (397) injury was the cause in 168 and disease in 229.

A statistical account of the various diseases and injuries reported from the different stations is provided. There was an increase of influenza cases of 17.24 per 1,000, as compared with the five years' average, but the disease was of a very mild type, and the death ratio in 1920 was the same as the average. A relative decrease in incidence occurred in pneumococcal infections of the lungs and rheumatic fever, a slight increase in nerve diseases, and a fractional increase in tuberculosis. In the case of venereal diseases there was an increase of 3.37 per 1,000 in the incidence ratio, as compared with the five years' average, the highest case ratio (304.88) being given by the China Station, and the lowest (81.93) by the Home Station.

DEATHS IN THE SERVICES.

Surgeon-General William Richard Browne, C.I.E., Madras Medical Service (ret.), died at La Soldanelle, Rougemont, Switzerland, on September 16th, aged 74. He was born on May 23rd, 1850, educated at Queen's College, Belfast, and at the Carmichael School, Dublin, and graduated as M.D. and M.Ch. in the Queen's University, Ireland, in 1871. He entered the I.M.S. as assistant surgeon on April 1st, 1873, and was promoted to surgeon three months later, when the rank of assistant surgeon was abolished. After ten years' service in military duty and as a district surgeon, he was posted to the Madras Medical College in 1883 as professor of pathology and resident surgeon of the college hospital, and spent just twenty years at the college, during which time he held successively several chairs, ending up as principal and professor of medicine. He was promoted to colonel on May 19th, 1903, and reverted to military duty as principal medical officer (what would now be called A.D.M.S.) of the Madras district. Eighteen months later he was selected for the post of surgeon-general, Madras, and head of the Madras Service, on October 11th, 1904, when he succeeded Surgeon-General Sinclair. He retired on April 1st, 1908. He received the C.I.E. on January 1st, 1906, and a good service pension on March 25th, 1907. His only war service was the Rumpa rebellion of 1879-80.

Colonel George Henry Barefoot, C.B., C.M.G., Army Medical Staff (ret.), died suddenly in London, on September 13th, after playing bridge at the East India United Service Club. He was born at Tripasur, South India, on December 29th, 1864, educated at University College, London, and after taking the Scottish triple qualification in 1885 entered the army as surgeon on July 28th, 1886. He was gazetted colonel in the long promotion list of March 1st, 1915, and retired on October 7th, 1919. He served in the Hazara campaign on the North-West frontier of India in 1888, when he was mentioned in dispatches, and received the frontier medal with a clasp. As a lieutenant-colonel he held the posts of senior medical officer at Dinapore in Bengal, and at St. Lucia in the West Indies, and the command of the military hospital at Winchester. During the recent war he served as a D.D.M.S., was thrice mentioned in dispatches—in the *London Gazette* of October 19th, 1914, January 1st, 1916, and January 4th, 1917—and received the C.M.G. in 1915 and the C.B. in 1917.

Lieut.-Colonel John Armstrong, R.A.M.C. (ret.), died at Old Charlton, Kent, on August 31st, aged 69. He received his medical education in the school of the Royal College of Surgeons, Ireland, and took the L.R.C.S.I. in 1875 and the L.K.Q.C.P. in 1876. Entering the army as surgeon on August 5th, 1877, he became lieutenant-colonel after twenty years' service, and retired in July, 1903. He served in the South African war from 1899 to 1902, when he was P.M.O. to the 2nd Division, Natal Field Force, under General Sir Redvers Buller, V.C., and was present at the actions of Vaal Kranz and Pieters Hill, the operations on the Tugela Heights, and in the relief of Ladysmith; he received the Queen's and King's medals, with three and two clasps respectively.

Major Ferdinand Clarence Smith, Madras Medical Service (ret.), died suddenly of heart failure at Watford, Herts, on August 7th, aged 69. He was the son of the Rev. Dr. Francis Smith, M.A., M.D.Cantab., of Parkstone, Dorset, for several years consular chaplain in Buenos Aires, and a nephew of Deputy Surgeon-General Clarence Cooper, I.M.S., who, at the age of 94, has been for the past year the senior officer on the retired list of the Indian Medical Service. Major Smith was educated at University College, London, and took the M.R.C.S., the L.R.C.P.Lond., and the L.S.A. in 1877, and the F.R.C.S.Eng. and the M.B. and M.S.Durh. in 1893. He entered the I.M.S. as surgeon on March 30th, 1878, became surgeon major after twelve years' service, and retired on July 1st, 1895. While in the I.M.S. he held the important posts of surgeon to the Madras General Hospital and of civil surgeon of Tanjore, and superintendent of the Prince of Wales's medical school at that station. After his retirement he remained in Madras, where he had a large practice, for twenty years, till 1915, when he came to England to offer his services in the war. After serving for two years at base hospitals in France he was appointed, in 1917, surgical specialist to the Indian War Hospital at Karachi, but was invalided in the following year, suffering from rheumatic fever, originally contracted in France, which affected his heart, and from the effects of which he never fully recovered. After eighteen months' severe illness he was able to begin practice at Watford, where he was held in great affection by his numerous patients.

[1] Statistical Report of the Health of the Navy for the year 1921. London: H.M. Stationery Office, or to be purchased through any bookseller. 1924. 6s. 6d. net.

Universities and Colleges.

UNIVERSITY OF LONDON.

UNIVERSITY COLLEGE.

ON Friday, October 3rd, at 5.30 p.m., Professor T. Percy Nunn will lecture on the scientific interpretation of nature. This lecture is introductory to the new course for the M.Sc. on the principles, history, and method of science. Professor Ernest Starling will be in the chair. The lecture is open to the public without fee or ticket.

Obituary.

THE LATE MR. BROMFIELD PATERSON.—We are indebted to Mr. J. G. Turner, F.R.C.S., for the following personal appreciation of Mr. W. B. Paterson, formerly dental surgeon to St. Bartholomew's Hospital, London, of whom an obituary notice was published last week.

The death of William Bromfield Paterson deprives me of one of my dearest friends, and I cannot but believe that many—many others who knew him perhaps better than I did—will be glad to read even a halting tribute such as I may write. The many knew him as an eminent professional man, the few knew him as a happy, sympathetic personality, whose unfailing optimism lightened the darkest cloud. I remember, as but yesterday, the eve of the abortive international dental congress of 1914. It was to be held in London, and all was as near ready as could be, when the war cloud thickened. We consulted, and Willie Paterson's solution of the difficulty was a couple of days' fishing to calm our nerves—and two merrier days I never spent. Paterson showed me all the arts of the Devon fishermen—the Devonshire roll under barbed wire, the Devonshire knot, and the Devonshire crawl to approach your fish. Only one thing failed—we caught no fish. But we were happy, and it was characteristic of the man that all around were cheerful through his splendid belief in "higher things" and in England's worth.

DR. MICHAEL WILLIAM KELLY, who died on August 24th, aged 45, was the son of the late Mr. Michael Kelly of Wexford, and was educated at the Catholic Medical School in Dublin. In 1904 he received the diplomas of L.R.C.P.I., L.R.C.S.I., and L.M. After filling the posts of house-surgeon to the Mater Misericordiae Hospital, Dublin, and assistant master of the National Maternity Hospital, Dublin, he also held appointments at the Portrane Asylum, Donabate, and the Royal Victoria Hospital, Bournemouth. He was appointed, in 1907, medical officer to the Killanne Dispensary District, Enniscorthy. He took part in the framing of the regulations which established the Irish Board of Health, and was one of the medical representatives on the Board. During the second Dail he was a district court judge, and until some months ago was chairman of the North Wexford Sinn Fein executive. He had been a member of the British Medical Association since commencing practice. He leaves a widow and three children.

DR. GRALL, the Inspector-General of the French Colonial Health Service, who died recently at Nice, spent most of his life in Guiana, New Caledonia, Indo-China, and, during the war, in the Near East. His numerous publications included studies of leprosy, malaria, and yellow fever; he collaborated also in the production of a treatise on tropical pathology.

OPENING OF THE WINTER SESSION.

LONDON MEDICAL SCHOOLS.

THE following arrangements have been announced in connexion with the opening of the new winter session at the various medical schools in London.

The St. Bartholomew's old students' dinner will be held on Wednesday, October 1st, in the Great Hall of the Hospital at 7 for 7.30 p.m., with Dr. J. H. Drysdale in the chair.

The prizes to students at Charing Cross Hospital Medical School will be distributed on Wednesday, October 1st, at 3.30 p.m., by Sir Humphry Rolleston, Bt., President of the Royal College of Physicians of London. The annual dinner of past and present students will be held on the evening of the same day at Gatti's Restaurant, when the chair will be taken at 7.30 by Mr. Charles Gibbs, senior surgeon to the hospital.

The prizes at St. George's Hospital Medical School will be distributed on Wednesday, October 1st, at 3 p.m., by Sir Isambard Owen, M.D., who will also preside at the annual school dinner at the Hotel Metropole on the same evening.

At the opening of the new session at King's College Hospital Medical School, Denmark Hill, on Wednesday, October 1st, at 2.30 p.m., the introductory address will be delivered by Sir David Ferrier, M.D., F.R.S., Emeritus Professor of Neuropathology and Fellow of King's College. The chairman of the hospital, Viscount Hambleden, will preside.

The annual old students' dinner of the London Hospital Medical College will be held on Wednesday, October 1st, at the Trocadero Restaurant, under the chairmanship of Professor William Bulloch, F.R.S.

The annual dinner of past and present students of St. Mary's Hospital Medical School will be held at the Connaught Rooms, Great Queen Street, W.C., on Monday, October 6th, when Dr. E. M. Callender, C.B.E., will take the chair at 7.30 p.m.

The winter session of the Middlesex Hospital Medical School will open on Wednesday, October 1st; Dr. Charles Porter will deliver an introductory address at 3 p.m. at the Queen's Hall on some aspects of preventive medicine, and the prizes will be distributed by Lord Birkenhead. The annual dinner will be held the same evening at 7.30 at the Hotel Cecil, when Mr. G. Gordon-Taylor will preside.

The annual dinner of past and present students of St. Thomas's Hospital will be held on Friday, October 24th, at Prince's Restaurant, Piccadilly, W., under the chairmanship of Dr. Seymour Taylor.

Owing to the sudden death of Dr. Sidney Martin, senior physician to University College Hospital, the dinner of the past and present students which was to have been held at the Hotel Cecil on October 3rd has been postponed to some date to be arranged in December.

At the University of London, University College, on September 29th and 30th from 10 a.m. to 1 p.m., first-year students of the Faculty of Medical Sciences will be received by the Provost, the Dean of the Faculty, and the Subdean. On September 29th, from 2.15 to 4 p.m., students of the Faculty of Medical Sciences other than first-year will be received; on the same day at 3.15 p.m. candidates for the Diploma of Public Health will be received by Professor Kenwood. The new buildings for anatomy, anthropology, embryology, histology, and physiology, provided from the gift of the Rockefeller Foundation, are now completely equipped.

At the Westminster Hospital Medical School the new session will begin on Thursday, October 2nd, and the inaugural address will be delivered in the board room of the hospital at 3 p.m. by Mr. H. J. Waring, on "The medical man of the future."

At the opening of the eighty-third session of the Pharmaceutical Society of Great Britain the President, Mr. F. Pilkington Sargeant, will deliver the inaugural sessional address and present the Pereira medal on Wednesday, October 1st, at 3 p.m.

NEWCASTLE.

In connexion with the opening of the winter session 1924-25 at the University of Durham College of Medicine, Newcastle-upon-Tyne, an introductory address will be given by Sir Thomas J. Horder, Bt., M.D., physician to St. Bartholomew's Hospital, in the Examination Hall of the College, on Monday, October 6th, at 4 p.m.

Medical News.

THE Royal Society of Medicine will hold its first social evening of the session at 1, Wimpole Street, London, W.1, on Thursday, October 16th, at 8.30, when Fellows and guests will be received by the new President, Sir StClair Thomson. At 9.30 p.m. Dr. Grenfell of Labrador will give a brief discourse on "Medicine in a corner of the Empire," with lantern illustrations.

THE annual dinner of the Chelsea Clinical Society will be held at the Café Royal, Regent Street, W., on Tuesday, October 21st, at 7 for 7.30 p.m.

THE second week of the course in general medicine and surgery at the Westminster Hospital begins on Monday next, September 29th; entries can still be accepted. On the 30th a four weeks' course of lecture demonstrations will be started at the Bethlem Royal Hospital. The lectures are given on Tuesdays and Saturdays at 11 a.m. by Dr. Porter Phillips and Dr. Thomas Beaton, and the fee for the course is one guinea. Commencing on October 6th, a course on tropical medicine at the London School of Hygiene and Tropical Medicine comprises a series of eight clinical demonstrations, and extends over four consecutive weeks. A series of four lecture demonstrations on treatment by electro-therapy will be given by Dr. C. B. Heald at the Royal Free Hospital, beginning on October 7th. Syllabuses of all these courses may be obtained from the Secretary of the Fellowship of Medicine, 1, Wimpole Street, W.1.

A COURSE of instruction for health visitors and child welfare workers commences at the Royal Sanitary Institute, Buckingham Palace Road, London, S.W., on September 29th, as a preparation for the health visitors' examination of the institute. The subjects to be dealt with include vital statistics, health legislation, duties of health visitors, ante-natal and infant hygiene, house sanitation, and home visiting. In connexion with the course visits will be paid to welfare centres, clinics, and schools for mothers. A course of practical training for meat and food inspectors will be held at the institute from October 3rd onwards.

AT a meeting of the Medical Officers of Schools Association to be held on Wednesday afternoon, October 8th, at 11, Chandos Street, Cavendish Square, W.1, Dr. Robert Hutchison will open a discussion on the relative values of stone-milled and other flours and breads in relation to the nutrition of the growing child. There will be an illustrative exhibit of stone-milled flours, breads, and other wheaten foods, etc. Tea will be served at 4.30, and the discussion will continue from 5 to 7 o'clock.

THE thirteenth annual general meeting of the British Commercial Gas Association will be held at Liverpool on Monday, Tuesday, and Wednesday of next week. The programme includes a lecture by Dr. C. W. Saleeby on "Light and Life," and an address by the Bishop of Liverpool on "The Worker and his Work."

AN epidemic of bacillary dysentery has recently broken out in Pomerania.

THE Ministry of Health announces that the statements in a recent issue of the *Daily Express* as to the stamping out of tuberculosis within the next ten years, and as to the Spahlinger treatment for tuberculosis, are incorrect and unauthorized. The most recent official statements as to the decline in tuberculosis and the Spahlinger treatment are contained in the Annual Report of the Ministry for 1923-24 and the Report of the Chief Medical Officer for 1923.

THE second number of the *Junior Red Cross Journal*, just published by the British Red Cross Society, contains an account of the work and methods of the Junior Red Cross in health education. A description is given of the Star and Garter Home for Disabled Sailors and Soldiers at Richmond and the special work performed by the Red Cross in connexion with the Scout Jamboree at Wembley. The number is well illustrated and should interest, as well as instruct, the children to whom it is addressed.

DR. F. J. WALDO, at the Southwark coroner's court, on September 19th, referred to the new regulation of the London County Council disallowing fees to medical officers of Poor Law institutions for making necropsies. In his other jurisdiction in the City of London he still continues to pay the Poor Law and prison medical officers their statutory fee of 1 guinea for performing a necropsy, and 1 guinea for giving evidence when called upon by himself as City coroner. Dr. Waldo said he had always been in favour of a fee of 2 guineas being paid for a complete *post-mortem* examination performed on a coroner's order, as was the practice in Australia, together with a fee of 1 guinea a day for giving evidence, this being payable to all registered medical practitioners without distinction.

THE sixteenth report of the Norwood Sanatorium for the Treatment of Alcoholism and other Drug Habits (The Mansion, Beckenham Park, Kent) covers the three years 1921, 1922, and 1923. During the first of these years 201 patients were admitted, and during each of the second and third 214 patients. The report includes clinical notes by the medical superintendent, Dr. Francis Hare, and an account of the treatment adopted.

THE Tokyo death rate has increased 100 per cent., as compared with the period before the earthquake last year. This is largely due to the prevalence of infectious diseases, including typhoid fever. It is officially reported, however, that contagious diseases are rare among those living in improvised dwellings owing to the precautionary measures in force. On July 10th a medical examination was made of 22,284 persons out of the 43,774 so accommodated, with the result that no case of infection was detected, there being brought to light only three cases of sunstroke, seventeen of influenza, and sixty-four of intestinal catarrh.

DR. M. JEAN CAMUS, professor of physiology at the Paris Medical School, has been elected a member of the French Academy of Medicine.

THE following congresses of Italian societies have been arranged. The thirteenth Congress of Stomatology will be held at Naples from October 13th to 17th, when the following subjects will be discussed: rearrangement of odontological studies, introduced by Professor A. Beretta of Bologna; pathogenesis of dental caries, introduced by Professor G. Manicardi of Modena; odonto-facial neuralgia, introduced by Dr. G. Grandi of Trieste. The Congress of Pediatrics will be held at Milan from October 22nd to 25th, when C. Pestalozza and C. Doria will introduce the subject of the determination of the food ration in the child; G. Berghinz the subject of diathesis and constitution in infancy; whilst "parascholastic" institutions and their hygienic and social importance will be discussed by M. Raspi. The Congress of Surgery will meet at Milan from October 26th to 28th; a discussion on sympathectomy will be introduced by G. Uffreduzzi, and another on indications for operation in splenomegaly by F. Micheli and Cappelli. The Congress of Internal Medicine will follow the Congress of Surgery at Milan from October 28th to 31st, and deal with the following subjects: suprarenal syndromes, introduced by M. Pende and C. Piazza; and progress in the diagnosis of nephritis, introduced by L. Ferranini; the members will unite with those of the Congress of Surgery in the discussion of operation in splenomegaly. The Italian Society of Urology will hold its annual meeting at Milan on October 29th, when G. Lasio will speak on diverticula of the bladder, and C. Bruni and S. Colombino will discuss fulguration of the vesical mucosa. The twenty-first congress of the Italian Society of Dermatology and Syphiligraphy will be held at Padua in the second fortnight of December, when the subjects to be discussed will be experimental cutaneous cancer, introduced by Professor E. Bizzozero of Turin, and the cure of syphilis, introduced by Professor L. Tommasi of Florence.

THE eleventh French Congress of Hygiene will be held in Paris from October 20th to 24th, when the following papers will be read: Instruction in hygiene in France, by MM. Dequidt and Rochaux; preliminary report on instruction in hygiene abroad, by M. Léon Bernard; instruction in hygiene in secondary schools, by M. Pacaut and Mlle T. Robert; instruction in hygiene in technical institutes, by M. Fras; experimental hygiene and laboratory research, by M. Dujarric de la Rivière; general hygiene and social hygiene, by M. Briau; cleansing of used water, by M. Dienert; role of sunlight in the growth of the child and the physiological equilibrium of the adult, by M. Armand Delille. Admission to the congress is free. Further information can be obtained from M. Bossus, 142, Boulevard Montparnasse, Paris.

THE third International Congress of Military Medicine and Pharmacy will be held in Paris from April 20th to 25th, 1925. An executive committee has been formed, consisting of Inspector-General Vincent as president, Drs. Achard, Dopter, Faure, Hartmann, Lejars, Nobécourt, Teissier, and others.

THE tenth French Congress of Legal Medicine will be held at Lille from May 18th to 20th, 1925, under the presidency of Dr. J. Leclercq of Lille, when the following subjects will be discussed: (1) Death from "inhibition," introduced by Dr. Duvoir of Paris; (2) Trauma and malignant growths, introduced by Drs. Cordonnier and Mullen of Lille; (3) The criminality of persons with skull wounds, introduced by Dr. Porot of Algiers.

THE French Society of Ophthalmology, at the invitation of the corresponding Belgian Society, will hold its thirty-eighth congress in Brussels next year, commencing on May 11th.

A BUST of the celebrated sixteenth century physiologist, Santorio Santorio, was recently unveiled at Capodistria at the termination of the Italian Congress of Hydrology.

Letters, Notes, and Answers.

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.* Authors desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Financial Secretary and Business Manager, 429, Strand, W.C.2, on receipt of proof.

ALL communications with reference to advertisements as well as orders for copies of the JOURNAL should be addressed to the Financial Secretary and Business Manager, 429, Strand, London, W.C.2. Attention to this request will avoid delay. Communications with reference to editorial business should be addressed to the Editor, BRITISH MEDICAL JOURNAL, 429, Strand, W.C.2.

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—not necessarily for publication.

THE telephone number of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is Gerrard 2630 (Internal Exchange). The telegraphic addresses are:

EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology Westrand, London.*

FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westrand, London.*

MEDICAL SECRETARY, *Medisecra Westrand, London.*

The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin;* telephone: 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh;* telephone: 4361, Central).

QUERIES AND ANSWERS.

"A. P." (Pretoria) desires to find a paper by Hutchinson which deals with the aspects of colonies of bacilli as seen in microscopic sections. Schubert (*Centralbl. f. Bakt.*, Originale, 1920) refers to it, but omits to say where it was published. Efforts to trace the paper in South Africa have proved fruitless. A letter addressed to Dr. Schubert has not been answered.

TREATMENT OF ALOPECIA.

"MEDICO" asks for suggestions for the treatment of a case of alopecia (non-syphilitic) in a patient who so far has resisted the usual washing with Hebra's soap spirit and ordinary hair tonics.

CONSTRUCTION AND EQUIPMENT OF ANTE-NATAL, TUBERCULOSIS, AND OTHER CENTRES.

"SANITAS" would like to know of a book dealing specially with the public health services in relation to ante-natal work, maternity centres, tuberculosis and venereal disease dispensaries, and treating of the size, equipment, etc., of such centres for rural and urban areas, small towns, and large cities.

*** We have made inquiries, but have failed to hear of any work of the kind.

INCOME TAX.

"W. J. D." has a practice in Malaya, but is residing temporarily in this country. He receives monthly remittances of the profits of his practice after payment of the fees of his locumtenent. How should the income be assessed?

*** Our correspondent should consider the facts of the case and decide whether he is in fact still conducting the practice through his locumtenent or whether he has for the time being given up control of the practice. In the former case he would be able to claim the "earned" relief, but might be held liable to account for tax on the net unremitted profits (if any); in the latter case he could return the income as derived from a "foreign possession" liable on the basis of the actual sums remitted. On that footing his liability works out as follows for 1924–25:

Income from practice in Malaya	£350		
Income from investments in Malaya	£270		
		£630	
Deduct—Personal allowance (married)	£225		
Children allowance (2)	£63		
		£283	
Income liable to tax		£342	
Of which £225 is chargeable at 2s. 3d. ...	£25 6 3		
£117 " " 4s. 6d. ...	£26 6 6		
		£51 12 9	

No deductions are due in respect of the purchase of the car in this country or the expense of attending post-graduate classes; such expenditure is in the nature of capital outlay, and in any case is not incurred in the earning of the income now received from Malaya.

"D. G. C." inquires whether he is liable to pay local rates in respect of a house which has been standing empty but for which he has been paying rent.

*** If the house was empty—that is, not containing furniture—there was no beneficial occupation and the rates are not legally enforceable.

LETTERS, NOTES, ETC.

HERPES AND VARICELLA.

DR. FREDERICK MACSORLEY (Belfast) writes: The following case, which recently came under my notice, serves to prove that a casual connexion exists between herpes zoster and varicella. A girl, aged 5, developed chicken-pox. She lived in the downstairs portion of a house with her father and mother. The upper portion of the house was inhabited by a man and his wife. About twelve days after the rash appeared in the child a herpetic eruption developed in the father, in the right fourth to seventh intercostal spaces. Simultaneously, the woman in the flat above developed well marked herpes zoster supraorbitalis. Mere coincidence does not explain satisfactorily the occurrence of two cases of herpes in a house where varicella exists.

DERMATITIS DUE TO HAIRY CATERPILLAR.

DR. C. B. ROSSITER (London, E.C.) writes: Surgeon Commander Cock's note in your issue of September 20th (p. 550) with reference to my observation on caterpillar dermatitis is very interesting. I merely desired to record the peculiar fact that the insect seems to be able to expel its fine hairs like porcupine quills or arrows, and it now appears that these are analogous to poisoned arrows. Still it is curious that while each hair sticking in the epidermis is surrounded by a ring of hyperaemia the intervening spaces, unless altered by scratching, are clear and normal, whereas if the irritant produces its effects by mere contact or smearing, as suggested by Fabre, one would expect the hyperaemic areas to be patchy or continuous—for example, as they would be, say, if painted with acetum cantharidis. Those familiar with the prickly pear know that if an attempt is made to pluck the fruit with the naked hand one is rewarded with a shower of fine hairs which shoot out of the fruit and stick into the fingers, etc., setting up most intense irritation. Possibly these hairs are also covered with some chemical irritant, but it seems hardly necessary to assume that more than the mere penetration of the hair into the epidermis is required to produce what in my opinion is a very analogous condition. Another instance I might quote is the irritant effect of cowhage [the stinging hairs of *Mucuna pruriens*] in its usual dry commercial condition. A little scattered and lightly rubbed on the hand produces an almost identical effect to the above, and if a lens is used the hairs can be seen sticking out erect from the epidermis, each with its hyperaemic ring. A curious fact also is that while these caterpillars are covered with both very long and very short hairs it is only the short variety which is seen on the skin, and these hairs would be sheltered by the long ones from the irritant "droppings." Possibly an explanation is that only caterpillars that "dwell in nests" have the power of expelling their hairs, but here my knowledge of entomology fails me.

POISONING BY MUSHROOMS.

DR. J. S. PEARSE (Plymouth) writes: Dr. W. B. Winckworth's note of cases of poisoning by mushrooms (September 13th, p. 493) is of interest. As he suggests, a possible explanation of the poisoning may be in the cooking. One fact that should be kept in mind is that mushrooms should never be cooked twice. If they form part of a stew, and the stew be left to cool and then reheated, the mushrooms are liable to become poisonous. To take whisky, brandy, or gin with mushrooms is dangerous, and asking for trouble. Having eaten the stalks as well as the tops of many a mushroom without any ill effects, I am sceptical as to any poison being contained in the stalk. Of course, if any extraneous matter adheres to the stalk one can well believe some ill effects may arise from the eating of it. It is therefore advisable to cut off the end of the stalk and to peel the top. Mushrooms are a valuable food, containing, as they do, some 3½ to 4 per cent. of protein.

PAPILLOMATA OF THE LARYNX OF CHILDREN.

DR. CHARLES J. HILL AITKEN (Kilnhurst, near Rotherham) writes: In his book, *Diseases of the Nose and Throat*, Mr. Tilley tells of three children who, because of their symptoms, were diagnosed as suffering from diphtheria with larnygeal obstruction and treated accordingly; later the correct diagnosis of papillomata was made. Fortunately I had read this, otherwise I might have been misled when I was called to a child, aged 4 years, with marked laryngeal obstruction. I advised tracheotomy, which was performed, and a few weeks later papillomata were removed from the larynx. This attack of dyspnoea was the worst the child had suffered. I was lucky to have seen the patient in the attack, as others had attended the child on previous occasions, but the parents had decided that, as the croupy cough complained of disappeared under treatment with a simple cough mixture, they did not need to take the child to see the doctors again.

ACUTE PUERPERAL INVERSION OF THE UTERUS.

DR. J. R. C. STEPHENS (M.O. West African Medical Staff, Ilorin, Northern Nigeria) writes that he was interested to read in the BRITISH MEDICAL JOURNAL of July 12th, which arrived by the last mail, the notes on inversion of the uterus (p. 88). He sends the following record of a case he saw recently. "Early one morning I was asked to see a native woman, but did not know what troubled her. I went to her house and found her on the mud floor (all women are delivered here in the sitting position) with a fine female child, the placenta being on the ground but not separated. The woman herself was sitting in a pool of blood, faeces, and urine, the fundus of the inverted uterus nearly touching the ground. She was quite cheerful, with good pulse, and complained of being hungry. I took a pad of cotton-wool and gently replaced the uterus, and left her to be cleaned. I had no conveniences for any treatment at the time. I saw her again in the afternoon, and she was perfectly well; two days later she walked to my out-patient department with the babe on her back. Since then she has made no further appearance at the hospital, and I often see her carrying the child, which is doing well."

NEOLITHIC MAN IN MALTA.

DR. T. ZAMMIT, C.M.G., Rector of the University of Malta, and Dr. Charles Singer have contributed a joint paper to the *Journal of the Royal Anthropological Institute* (vol. liv) on neolithic representations of the human form from the islands of Malta and Gozo. The figures were found in what were no doubt temples usually built in pairs. In the instance of which a diagram is given one of the pair is much larger than the other. The figures are of both sexes, but their peculiarities are most striking in those representing women. They have enormous buttocks, fat bellies, and pendulous breasts, but small hands, feet, and heads. The artist must have possessed considerable skill, for some of the faces are so specialized that, as the authors say, they were almost certainly portraits. In showing figures of extreme fatness the artist would seem to have been working in compliance with some convention, probably religious, which, as is suggested, may have had something to do with fertility, the fat images being conducive to fat crops; but the result, especially the back view, is distinctly comical. The portrait models are probably of an offertory character. The date of the temples and statues does not appear to be known, but they seem to have been erected before metal reached the islands.

A HOUSE OF REST.

DR. D. W. SAMWAYS (Knowle, Clyst St. George, Devon) writes: There is in Mentone a "house of rest" provided for professional men with restricted means who are temporarily in need of rest or change. An inclusive charge of 30s. weekly is made. The home opens on November 1st. It may, on occasion, be useful to members of the profession or to some of their patients. Particulars can be obtained by writing to the Matron (Miss Goldie), House of Rest, Quartier Carnoles, Menton, Alpes-Maritimes, France. Dr. Stanley Rendall and I act as honorary physicians.

A JENNER RELIC.

DR. C. HOWARD JACKMAN (Heworth Green, York) writes: In the BRITISH MEDICAL JOURNAL of September 20th it is stated that Mr. G. A. Turner of Worcester has the horns of the first cow from which the late Dr. Jenner procured his vaccine lymph owing to an inscription written on them by his great-nephew, which proves nothing. I maintain that the horns of the first cow are in my possession; they were given by the late Dr. Jenner to my great-grandmother, Mrs. Crome, whose children he vaccinated.

NIGHT ASSISTANCE FOR MOTORISTS.

THE Automobile Association informs us that it has a number of road service outfits patrolling roads widely used by motorists after dark. With the arrival of "winter time," the A.A. patrols doing day duty on cycles, motor cycles, and road service outfits are now on the roads from 9 a.m. until lighting-up time—that is, one hour after sunset. The night road service outfits and A.A. roadside fuel stations work from lighting-up time to midnight, so that, in many cases, the A.A. road organization works continuously from 9 a.m. until 12 midnight. This A.A. night service, instituted at Easter, is greatly appreciated by members. In addition to carrying "spares" and an equipment of light tools, the A.A. patrols in charge of these outfits procure assistance, or tyres, etc., from garages, when breakdowns are of a serious nature.

IN view of the number of unbranded motor spirits at present selling as No. 1 without any guarantee as to quality, the British Petroleum Company, Ltd., has decided to drop the numerical designations in connexion with its three grades of petrol, and these in future will be known as "'BP' Aviation," "BP" (for cars and motor cycles), and "'BP' Commercial" for heavy vehicle use.

A WARNING.

THE individual referred to by Dr. W. G. Niall of Chatham (August 23rd, p. 348) and by Dr. Arthur Lee of Bournemouth (September 13th, p. 494) seems recently to have been visiting the neighbourhood of Birmingham and Leamington.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 34, 35, 38, and 39 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 36 and 37.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *124*.